

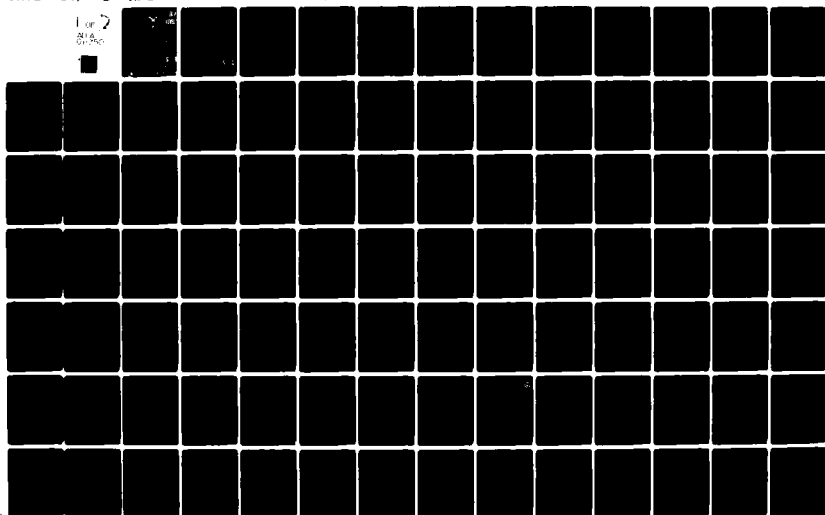
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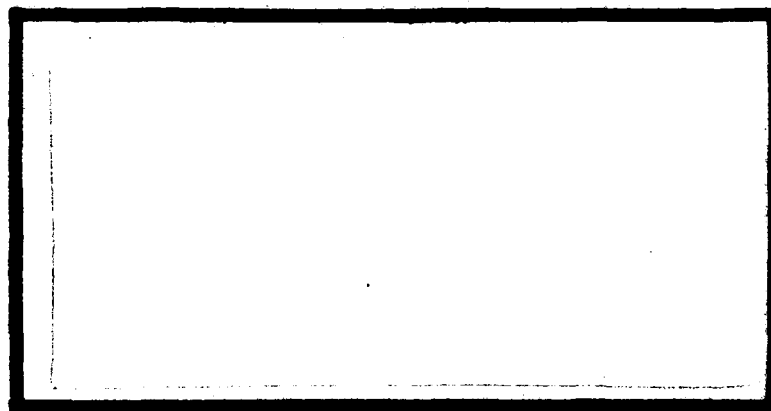
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A STUDY OF THE RELATIONSHIP BETWEEN
WORKER ATTITUDES AND ORGANIZATIONAL
EFFECTIVENESS IN BASE LEVEL
ENVIRONMENTAL AND CONTRACT
PLANNING SECTIONS

Coy S. Baxley, 1Lt, USAF
Roy K. Salomon, Captain, USAF

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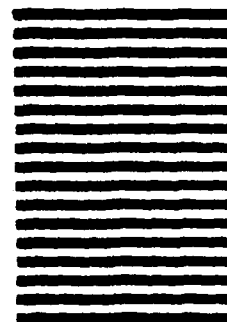


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This study identifies the significant relationships which exist between specific worker attitudes and specific measures of organizational effectiveness in base level Environmental and Contract Planning Sections. Data on both attitudes and perceived organizational effectiveness were collected from 76 bases, using a mailed questionnaire. A total of 262 usable responses were obtained. Factor analysis was employed to reduce the large number of attitude questions to ten factors. A canonical correlation analysis was then performed, and two significant relationships between the attitude factors and perceived organizational effectiveness were identified. The strongest relationship showed that group cohesiveness was positively correlated with each of the five measures of perceived organizational effectiveness. The second relationship found indicates that in sections where there is poor organizational climate, high responsibility and authority, and low satisfaction with the decision-making structure, we can also expect to find high production quantity and poor anticipation of problems. This research proved that specific relationships between worker attitudes and organizational effectiveness in Environmental and Contract Planning Sections did exist and could be identified.

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A STUDY OF THE RELATIONSHIP BETWEEN WORKER
ATTITUDES AND ORGANIZATIONAL EFFECTIVENESS
IN BASE LEVEL ENVIRONMENTAL AND
CONTRACT PLANNING SECTIONS

A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Facilities Management

By

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June 1980

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has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN FACILITIES MANAGEMENT

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CHAPTER I

INTRODUCTION

Twenty people died in Donora, Pennsylvania in October 1948 as a result of an air pollution crisis. The pollution, trapped by a thermal inversion, was so concentrated that another 6,000 residents became ill (6:131). In 1966, a four-day air pollution incident in New York City caused another 80 deaths (4:324). By 1970, pollution in Cleveland, Ohio was so intense that the Cuyahoga River actually caught fire. Lake Erie was so polluted that many shoreline communities outlawed swimming. Boaters had to be inoculated for typhoid in case they fell in (6:131)!

These incidents, and other less publicized ones, were responsible for the overwhelming surge in environmental awareness displayed by the American public in the past two decades. When awareness changed to concern, public pressure was brought to bear on the pollution crisis. This pressure was, and continues to be, transformed into major environmental legislation.

Senator Edmund S. Muskie of Maine, in an address delivered in December 1969, concluded that:

In the final analysis, the Administration, the Congress and State and local governments will move to improve the environment in direct proportion to the degree of public awareness of the problem, the determination of the public to be heard, and the amount of informed opinion which is brought to bear on the problem [20:709].

In reaction to the National Environmental Policy Act of 1969, an Environmental Protection Group was formed at Headquarters, United States Air Force (USAF). This was the first identifiable and unified environmental planning program in the Air Force (30:1).

As the pace of new environmental requirements picked up steam in the early 1970's, the Air Force quickly found that its modest effort in environmental protection was inadequate. In September 1974, the Environmental Protection Group was reorganized and greatly expanded into an Environmental Planning Division, incorporating comprehensive planning and natural resources planning as well as environmental protection. Similar environmental planning functions were organized at the major commands the following month (30:1).

As had been the case at Headquarters USAF, environmental protection planning was to receive attention at the base level. Environmental Protection Coordinators were authorized in the Base Civil Engineering (BCE) organization in October 1975.

To coordinate Air Force programs at federal and state levels, the Air Force Regional Civil Engineers (AFRCE), located in Atlanta, Dallas, and San Francisco, were reorganized to include an Environmental Planning Division in October 1976 (15:1). Bases were not given a complete staff to perform their environmental planning functions until October 1977 (22:2).

With the establishment of the Environmental and Contract Planning Section as a part of the Engineering and Environmental

Planning Branch, the Base Civil Engineer finally had the necessary authorized manning to begin a comprehensive environmental planning program (39).

Problem Statement

The Environmental and Contract Planning Section was given responsibility for comprehensive planning of the airbase, management of natural resources, environmental protection, and contract planning (38:14). To perform these tasks, a multidisciplinary professional team was hired at each base (22: Appendix 1). It is essential that the professionals hired be able to work in close cooperation with each other if the section is to be effective in meeting its mandated environmental planning responsibilities. Because of this requirement for cooperation, the Air Force leaders responsible for environmental planning need to have an understanding of what factors contribute to a successful multidisciplinary effort if they are to manage effectively.

Background

Environmental Protection

The National Environmental Policy Act (NEPA), which was signed into law on 1 January 1970, changed the course of environmental planning throughout the Federal Government. NEPA, as its name implies, established a national policy for environmental protection; a policy around which subsequent laws and regulations have been forged. Section 2 of the Act

states that its purposes are:

To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality [34:Section 2].

Title I, Section 102 of NEPA contains enforcement provisions. These provisions were responsible for revolutionizing major decision-making in the Federal Government. The Act provides that (34:Section 102):

- (2) All agencies of the Federal Government shall-
 - (A) utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and decision-making which may have an impact on man's environment;
 - (B) . . . insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations;
 - (C) include in every recommendation or report on . . . major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official. . . .

These provisions require Federal agencies to prepare environmental impact statements and for decision-makers to give consideration to environmental impacts along with the economic and technical considerations of a proposal. The Council on Environmental Quality (CEQ) was charged with the responsibility of establishing guidelines to ensure compliance with NEPA. The CEQ guidelines, published on 1 August 1973, define how the environmental impact analysis process was to

work. This completed the revolution in Federal decision-making procedures that NEPA began. The CEQ guidelines require that (35:Section 1500.2):

As early as possible and in all cases prior to agency decision . . . Federal agencies will, in consultation with other appropriate Federal, State, and local agencies and the public, assess in detail the potential environmental impact. . . .

Included in the definition of environmental impacts were not only air pollution, water pollution, and noise pollution, but socio-economic impacts as well. The procedures for determining environmental impacts further required that Federal agencies obtain, evaluate, and consider the views of those affected by their decisions. A statement that a project is necessary for national defense usually has little meaning to those who feel that they are adversely affected (28:4). It does not matter which Federal agency caused a grievance; the effect is the same. Failure to adhere to established requirements provides the basis for effective challenge.

The absence of effective planning to meet these requirements has already resulted in public and legal challenges to Air Force policy decisions. There was public opposition to the F-15 beddown at Luke Air Force Base (AFB), Arizona. Citizens in Kansas City delayed the transfer of the Air Force Communications Service from Richards-Gebauer AFB for over two years (28:4). These examples are representative of not only the Air Force, but of the effects when any Federal agency fails to fully consider the impacts of its actions.

After several years, it became evident that a small

environmental protection group at Headquarters USAF was simply not sufficient to meet the workload which the environmental impact analysis process had generated. The combined effects of policy setbacks and an ever-increasing number of environmental laws forced the Air Force to expand its environmental planning capabilities (28:4).

Environmental protection could no longer stand alone. An interdisciplinary approach, as NEPA had mandated in 1970, was finally adopted in the 1974 reorganization (30:1).

While NEPA was a landmark in environmental law, it still was but one piece of legislation in a movement that goes back almost one hundred years.

The Rivers and Harbors Act of 1899 make it unlawful to deposit or discharge "refuse matter of any kind" into navigable waters or their tributaries (5:195). Efforts to enforce this law were rare until 1969 (27:194), hence the ineffectiveness of the Act and the continued degradation of water quality in the early 1900's.

In 1948, the Water Pollution Control Act was passed. This act placed the majority of the responsibility for water pollution control with the States (27:194), although it also provided for Federal technical assistance and Federal loans for treatment plant construction. The Act expired in 1956 and was replaced in that year by the Federal Water Pollution Control Act. This Act "is the legal backbone for our national water cleanup campaign [27:194]." This law authorized a grant program of \$50 million a year (for five years) for municipal

wastewater treatment plant construction. It also established research programs and improved enforcement procedures.

The Federal Water Pollution Control Act of 1956 was largely replaced in 1965 by the Water Quality Act (7:39). The Water Quality Act streamlined enforcement procedures and doubled the Federal funds available for individual treatment plants (7:44). Under the Act, authorized construction grants for fiscal year 1966 were \$150 million as compared to only \$50 million in 1956. Amendments to the Water Quality Act, providing for even more Federal financial assistance and control, were passed into law in 1970 and 1972.

Legislative efforts have not been limited to water pollution. Congress, in 1955, enacted the Air Pollution Control Act. This legislation gave the Secretary of Health, Education, and Welfare and the Surgeon General of the Public Health Service the authority to conduct research programs, give technical assistance, and develop air pollution control and abatement methods (5:227). The Air Pollution Control Act was replaced in 1965 by the Clean Air Act which provided the Federal Government more authority to solve air pollution problems. This law was still not enough, however. To further strengthen the Government's hand, the Clean Air Act Amendments of 1970 were passed (5:228).

Air and water pollution are not the only areas of recent environmental concern and congressional legislation. The effects of solid waste, pesticides, noise, and radioactive waste are also receiving considerable legislative attention.

In 1970, the solid waste generated in the United States amounted to one ton for each American (25:172). In 1969, over 75 percent of the solid waste collected was disposed of in unsightly open dumps (25:174). The Solid Waste Disposal Act of 1965 and the Resource Conservation and Recovery Act of 1976 are examples of legislative efforts to control solid waste pollution (41:Section 4).

Pesticide use has historically been a major contributor to human welfare (25:167). It has been estimated that a ban on the use of all pesticides would result in a 25 to 30 percent reduction in U.S. crop and livestock yields. Unfortunately, the widespread use of pesticides has not always yielded beneficial results; the much-publicized use of DDT being a prime example. Today the manufacture, transportation, and use of pesticides are heavily regulated through laws such as the Federal Environmental Pesticide Act of 1972 (41:Section 4).

Similarly, the generation of noise has been regulated by the Noise Control Act of 1972, which set noise emission standards; and the disposal of radioactive wastes has been regulated by the Atomic Energy Act, among others (41:Section 4).

While the National Environmental Policy Act established the requirement for the preparation of an environmental impact assessment for all proposed "major" actions, other laws were requiring the monitoring of wastes discharged into the air and water. In 1975, the Environmental Coordinator position was established within Base Civil Engineering to fulfill these requirements. This position was redesignated the

Environmental Protection Planner in October 1977 when the other environmental planning positions were established and the Environmental and Contract Planning Section was formed (9:1).

The Environmental Protection Planner is responsible for the "development, preparation, implementation, and maintenance of plans and programs related to environmental quality and protection, and pollution abatement and control [9:Atch.4]." This includes preparing Environmental Assessments and statements; evaluating and controlling air, water, and noise pollution; managing the base solid waste program; and performing related staff functions such as progress reports and ensuring the programming of environmental projects.

To accomplish these tasks, the Environmental Protection Planner must establish and maintain plans and programs relating to oil and paper recycling, the prevention/cleanup of oil spills, and sewage and air pollutant discharge monitoring (9:Atch.4). In addition, he must be highly interactive in the plans and programs of the entire section, as they are closely intertwined. For example, the Air Installation Compatible Use Zone (AICUZ) is the primary responsibility of the Community Planner, but also indicates general noise levels; an area of vested interest to the Environmental Protection Planner.

Comprehensive Planning

In the past ten years, the planning activities of the Air Force have also been profoundly affected by new legislative requirements. The Intergovernmental Cooperation Act of 1968 states (33:Section 401):

All viewpoints - National, regional, state and local - shall to the maximum extent possible, be fully considered and taken into account in planning federal or federally assisted development programs and projects.

Implementation of this Act, as well as similar provisions of the National Environmental Policy Act (NEPA) of 1969, has occurred through Office of Management and Budget (OMB) Circular A-95 (42). To carry out this interagency/intergovernmental coordination, designated state and areawide clearinghouses were established. The clearinghouses are responsible for referring projects to all agencies which may be affected. They then consolidate all agency replies and forward them to the proposing agency (40:Part 1).

Two other pieces of legislation have significantly affected comprehensive planning activities. First is the Department of Housing and Urban Development's "701" Comprehensive Planning Assistance Program which gained its name from Section 701 of the Housing and Community Development Act of 1954. The purpose of 701 planning has been to encourage local comprehensive development planning by financing two-thirds of the preparation cost of comprehensive development plans (42). Many local comprehensive plans for areas near Air Force bases are 701 Plans.

The second act which has affected Air Force planning is the Federal Water Pollution Control Act. Under Section 208, the Environmental Protection Agency encourages local governments in a specific area to identify and implement area-wide solutions to water quality management problems (42). The results of this planning are usually regional sewer systems. The land use implications of this are critical because development tends to follow the installation of sewer lines and other utilities (42).

The Air Force's Air Installation Compatible Use Zone (AICUZ) program is specifically designed to achieve compatibility between aircraft operations and adjacent communities through land use planning and controls enacted by the local community. AICUZ studies include identification and analysis of the noise and accident potential aspects of aircraft operations in the vicinity of a base as well as future compatible land use recommendations (42).

At the heart of all planning efforts is the comprehensive plan. A comprehensive plan is an official statement of a legislative body, which sets forth its major policies concerning desirable physical developments (30:Atch.1).

The basic characteristics of the plan are that it be comprehensive, general, and long-range. Comprehensive means that the plan encompasses all geographical parts of the community and all functional elements which bear on the community's physical development. General means that it is a statement of policy, not a map of finalized details. Long

range means that the plan's scope should extend ten to twenty years into the future. Additionally, the comprehensive plan should focus on physical development, relate physical design proposals to community goals, and be first a policy statement, and only second a technical instrument (16:371).

City planning is nothing new. The earliest known city planner was Hippodamus of Miletus, who prepared plans for several Greek cities in the fifth century B.C. (16:371). Throughout history there have been plans for many of the great cities of the world. In general, these have been grand designs devised and carried out by central rulers who had the means to finance them. Famous early American plans include L'Enfant's for Washington D.C., William Penn's for Philadelphia, James Oglethorpe's for Savannah, and Francis Nicholson's for Annapolis and Williamsburg. Looking back on these early plans, they were more than adequate to accommodate the technology of the time.

The type of comprehensive plan in use today came into existence about 50 years ago. Modern planning efforts are concerned with the continued development of an existing city, based on analyses of population, economy, and land use (16:352).

The Air Force has long recognized the need for a document which presents the present composition of a base and a plan for its orderly development. AFM 86-6, Master Planning, details what is to be contained in a base master plan.

The master plan is made up of three component parts:
1) Report, 2) Basic Data, and 3) Development Plans. The Report

presents actual data which is not capable of presentation in graphic form. The Basic Data is information presented in graphic and tabular form. The Development Plans portray the planned physical development of the base (36:Ch.2). Although the Air Force recognized the need to develop comprehensive plans for its bases, AFR 86-4, Master Planning, states, "The Master Plan should be prepared by competent Air Force Planners or Architect-Engineer firms [37:Para.4]." It also requires the maximum use of in-house planning capabilities. However, authorization for individual bases to hire qualified comprehensive planners did not come about until the 1977 reorganization of Base Civil Engineering (30:1).

In the past, the Air Force as well as civilian comprehensive planners tended to view planning as a large design project. The process involved forming a picture of a future, physical, development pattern; reducing it to a graphic presentation; and then developing the control measures needed to move the community toward the desired end (16:328). The objective was to make the community look like the prepared map of the future. The goals of the community were often not even stated. How can effective planning take place without established goals?

So, the question arises: What are we planning for? Answering this question is the essence of comprehensive planning. The development of general goals should come about through the interaction of the public, elected officials, and

the professional staff of the local planning agency (16:331). To be effective, the goals should be officially adopted by the local legislative body in the form of a policies plan. Adoption of a policies plan does not commit the community to any particular projects, but it does commit it to take actions that are consistent with the policy guidelines (16:331).

A comprehensive planning methodology, which may be more appropriate for government agencies than many civilian methodologies, is described in the book, The Oregon Experiment, by Christopher Alexander. The experiment took place at the University of Oregon in the early 1970's. The school had about 15,000 students and 3300 faculty and staff. It occupies a site on the outskirts of Eugene, a small town of about 84,000 inhabitants (2:1). What makes their experience so relevant for the Air Force is that the University of Oregon has a single owner (the State of Oregon), and a single, centralized budget. This is not the usual case in the civilian sector.

Alexander's description of earlier planning efforts sounds similar to existing master plans in the Air Force today.

Essentially a university master plan is a map. It is a map which portrays the university as it "ought" to be, at some fairly distant time - say twenty years from now. The map contains two kinds of elements - those which exist already and should, according to the planners, stay where they are, and those which do not now exist, and which need to be built. . . .

Implementing such a plan, at least according to theory, is simply a matter of filling in the blanks, according to the land use prescribed by the map. If the process is carried out faithfully, then the built

university, after the prescribed number of years, will correspond to the ideal map of the master plan [2:16-18].

Although the approach seems sensible in theory, Alexander (2:10) argues that master plans fail in practice because,

It is simply not possible to fix today what the environment should be like twenty years from today, and then to steer the piecemeal progress of development toward that fixed, imaginary world.

Alexander believes that the process of building and planning a community will create an environment which meets human needs only if it follows six principles of implementation. His book is devoted to the discussion of these principles. In outlines, he lists the principles as:

1. The principle of organic order.
Planning and construction will be guided by a process which allows the whole to emerge gradually from local acts.
2. The principle of participation.
All decisions about what to build and how to build it will be in the hands of the users.
3. The principle of piecemeal growth.
The construction undertaken in each budgetary period will be weighted overwhelmingly towards small projects.
4. The principle of patterns.
All design and construction will be guided by a collection of communally adopted planning principles called patterns.
5. The principle of diagnosis.
The well-being of the whole will be protected by an annual diagnosis which explains, in detail, which spaces are alive and which ones are dead, at any given moment in the history of the community.
6. The principle of coordination.
Finally, the slow emergence of organic order in the whole will be assured by a funding process which regulates the stream of individual projects put forward by users [2:5-6].

The Air Force has undertaken an effort to replace its

1959 Master Planning Manual with a new base comprehensive methodology which will utilize current planning processes, procedures, and techniques. The new methodology is being designed to respond to the requirements of the National Environmental Policy Act (NEPA), Office of Management and Budget (OMB) Circular A-95, and Department of Defense (DOD) energy conservation guidelines (24:Atch.1). A test of the new base comprehensive planning methodology is currently underway at Mather AFB, California.

The proposed methodology is comprised of four major tasks. Task 1 is establishment of base development objectives. Task 2 is to develop alternatives. Task 3 is to establish the impacts of the alternatives, and Task 4 is to evaluate the alternatives and then to select and implement the alternative which best satisfies the stated goals. Each of the four tasks is subdivided into as many as 15 individual steps. When implemented, the methodology will provide a systematic approach which will include public participation in the goal-setting process (24:Atch.1).

The Comprehensive Planner is responsible for the preparation, implementation, and maintenance of "plans and programs designed to achieve the most effective and efficient use of natural and man-made resources [9:Atch.2]." The plan of primary concern to the comprehensive planner is the Base Comprehensive Plan discussed previously. He is also responsible for the Air Installation Compatible Use Zone (AICUZ) program, Interagency/Intergovernmental Coordination for

Environmental Planning (IICEP) program, and the review of base plans, program, and regulations to ensure their compliance with the Base Comprehensive Plan.

Natural Resources

The United States Government has long been concerned with the preservation of natural resources. In 1849, the Department of Interior was established. The Department was originally concerned primarily with the development of what is now the western United States, but eventually, due to the efforts of conservationists such as Theodore Roosevelt, it came to emphasize the conservation of the nation's natural resources (32:103).

Even prior to the efforts of President Roosevelt, the nation had demonstrated its conservationist tendencies. Yellowstone National Park was established by President Grant in 1872, and became the first national park, not only in the nation, but in the world (32:113). Today, there are 283 national parks and monuments in the United States.

The ability of modern man to pollute and destroy the natural habitat of plants and animals has driven some species to extinction. To combat this tendency, Congress enacted the Endangered Species Act of 1973 (3:107-108). The result of the Endangered Species Act has been improved survival odds for many endangered species and the delay, or in some cases, the cancellation of federal projects. The two-year delay in completing the Tellico Dam Project in Tennessee, due to the

proximity of the snail darter, was such a case. Similarly, the proposed Over-the-Horizon Radar (OTHR) site was moved to avoid Maine's natural blueberry barrens (17).

The formation of the natural resources planner position in Air Force Civil Engineering was little more than a formal organizing of activities already performed. This concentration of activities was designed to facilitate interaction between natural resources activities and other environmentally related activities. It also provided an opportunity to hire a natural resources planner more adept at the job requirements than the typical Air Force engineer.

The Natural Resources Planner is responsible for the "development, preparation, implementation, and maintenance of plans and programs related to conservation and management of natural resources [9:Atch.3]." The effect of these plans and programs, logically, depends on the natural resources at each base and is, therefore, widely varied. More specifically, the Natural Resources Planner is concerned with fish and wildlife, forest management, outdoor recreation and cultural resources, land management, grazing and agricultural outleasing, land development, endangered species programs, and pesticide use and control (9:Atch.3).

Contract Planner

The contract planner position in the Environmental and Contract Planning Section is the oldest planning function in the section. Previously designated the Contract Programmer,

he is responsible for programming facility construction and maintenance requirements (9:Atch.5). More specifically, he is responsible for developing, preparing, and maintaining the Military Construction Program, Non-Appropriated Fund Program, Military Family Housing Program, and the Operations and Maintenance Contract Program (9:Atch.5). This position relates to the rest of the Environmental and Contract Planning Section in that the effect on the environment and relation to the comprehensive plan are only two of the many factors that must be considered when programming facility requirements.

Environmental Planning

The term Environmental Planning, as used by the Air Force, is synonymous with the term comprehensive planning as commonly used in civilian communities. It encompasses all physical, social, economic, ecological, and other considerations that comprise comprehensive planning. In addition, environmental planning incorporates Air Force master planning, natural resources planning, and environmental protection.

The goal of the Air Force environmental planning process is to establish, continually reassess, and maintain plans and programs designed to (30:Atch.1):

A. Provide for systematic and effective participation and coordination with all levels of government in matters of environmental planning so that Air Force needs and concerns are made known and protected.

B. Provide for current and long-range operational/support capability to perform assigned, proposed or potential missions.

C. Insure wise protection, provision, use and management of human, financial, natural and man-made resources.

D. Determine the desires, concerns, priorities and projected needs of the Air Force community.

E. Promote land use/airspace compatibility with off-base areas which affect or may be affected by base development and operations.

F. Promote the public health, safety, welfare and overall quality of life.

At the time the Environmental and Contract Planning Section was established in 1977, several other functions within Civil Engineering were reorganized. The industrial engineering function was reduced and cost accounting and real estate management functions were consolidated and realigned under the industrial engineering function. The manning authorizations made available by the industrial engineering reduction and the cost accounting and real estate consolidation were used to fund the newly validated environmental planning requirements. Manpower authorizations for environmental planning beyond the number made available by the reorganization had to be satisfied from existing resources or placed on the deferred requirements list (22:2).

The creation of the environmental planning function at the time other parts of the organization were losing manpower was fortunate. Without the funding for the new environmental planning authorizations that this provided, it may have taken several years to achieve the level of manning which was reached in a relatively short period of time.

Scope

Approximately 500 people are involved in environmental planning Air Force-wide. Of this total, around 400 are assigned at the base level (22:Atch.1). This research will be limited to personnel assigned to bases located in the continental United States. This is necessary since foreign bases are subject to Status of Forces Agreements with their host country. Since environmental requirements vary from country to country, it would not be appropriate to compare foreign bases with those located within the United States.

Commanders' environmental responsibilities were outlined in a policy letter dated July 1975 by Major General Robert C. Thompson (30:Atch.1). Responsibilities include both specific programs and overall responsibility for personnel and the environmental planning process. Of interest in this study are the factors which contribute to an effective multidisciplinary environmental planning process. To this end, this research effort will examine how the effectiveness of the Environmental and Contract Planning Section at the base level may be affected by worker attitudes.

Literature Review

In order to evaluate relationships between attitudes and effectiveness, it was first necessary to review the literature concerning these two areas.

Attitudes

Dawes begins his book on attitude measurement with the statement:

In 1935, Gordon Allport observed that "attitudes today are measured more successfully than they are defined." This statement is still true in 1971 [8:2].

This observation reflects the problem psychologists have had in arriving at a concensus on the definition of the construct of attitude.

Allport defined attitude as:

. . . a mental and neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual's response to all objects and situations with which it is related [12:8].

Another widely quoted early definition of attitude was proposed by Thurstone in 1931. He defined attitude simply as "the affect for or against a psychological object [12:20]."

Many writers conceptualize the attitude construct as multidimensional and include affective, cognitive, and behavioral components. The affective component, or feeling component, indicates that there is an emotional investment in a belief or cognitive component (18:167). The cognitive component consists of an element of knowledge obtained from a perception of certain facts. Finally, the behavioral component of an attitude refers to the predisposition to act toward the attitude object. Other common ideas which appear in attitude definitions are that, once established, attitudes tend to be a stable and enduring system, and that most attitudes do not stand alone in isolation from other attitudes, but form

clusters--the clusters not always being neat and orderly, however.

Three major theories about how the above mentioned components fit together to form the construct of attitude have developed over the years. All are based on solid research. First is the consistency theory put forth by Rosenberg (12:325-31), McGuire (12:357-65), and Cartwright and Tannenbaum (12:312-24) among others. Second is the behavior theory proposed by Lott (12:366-72) and Staats (12:373-76). Finally, there is the functional theory, which is older, but is well expressed by Katz (12:457-68).

The areas of general agreement among the theories will be presented here instead of reviewing each of the theories separately. For further discussion of the theories mentioned above, the reader is referred to Fishbein's book (12), Readings in Attitude Theory and Measurement, where writings from each of the authors referenced in the preceding paragraph are compiled.

Shaw and Wright have reviewed the theories and were able to identify seven general characteristics of attitudes common to them:

1. Attitudes entail an existing predisposition to respond to social objects.
2. Attitudes are based upon evaluative concepts regarding characteristics of the referent object and give rise to motivated behavior.
3. Attitudes are construed as varying in quality and intensity (or strength) on a continuum from positive through neutral to negative.

4. Attitudes are learned.
5. Attitudes have specific social referents.
6. Attitudes possess varying degrees of interrelatedness to one another.
7. Attitudes are relatively stable and enduring [26:6-10].

In this paper, the definition of attitude put forth by Bem will be adopted. He defines attitude as "an individual's self-description of his affinities for and aversions to some identifiable aspect of his environment [29:323]." This definition of attitude limits the theoretical construct of attitude to an affective component which is based upon cognitive process and is an antecedent of behavior (26:3). In using the unidimensional concept of attitude, the existence of the cognitive and behavioral processes is not being denied. Whereas many theorists treat these components as different elements of the same system which they call attitude, Bem treats them as separate (albeit closely related) systems, or elements, only one of which (affective) is labeled attitude.

As a practical matter, Thomas offers the following discussion on the practical use of multidimensional attitude definitions:

The most popular conceptions of attitude are multidimensional and include affective, cognitive and behavioral components. Thus attitude represents a residue of experience, cognitive and affective, of the social object in question, and a response tendency towards that object. Attitude in this sense is a "hidden mechanism" which directs behavior. But few empirical studies of attitudes operationalize the concept in this complex way. Many papers introduce research by defining attitudes as multidimensional and then measure only one or perhaps two aspects of the concept. Frequently the empirical measures are

unrelated to any theoretical position. The conclusions, however, tend to be referred to the three-component attitude construct. None of the multidimensional definitions of attitude discuss the quantitative nature of the relations between components, so that where attempts are made to measure affect, cognition and conation, there are no rules for combination of the data [29:10].

Attitude scales measure only one dimension of attitude, the affective reactions: positivity - negativity (26:11). Thus, defining the concept of attitude as an individual's self-description of his affinities for and aversions to some identifiable aspect of his environment (affective component), has the advantage of relating the theoretical construct most closely with the operation of actually measuring attitudes. Attitude scales are composed of statements of varying degrees of positivity and negativity regarding the attitudinal referent, and endorsement of the statements serves as the basis for inferring the existence of positive or negative attitudes.

Along the same line of thought, Fishbein states:

People who construct "attitude scales" rarely maintain that their instruments are measuring three components; instead, they usually contend that their scales indicate people's evaluations of, or affect toward, an object or concept. Thus, although attitudes are often said to include all three components, it is usually only evaluation, or "the affective component," that is measured and treated by researchers as the essence of attitude.

Furthermore, there is considerable evidence showing that this single "affective" score is highly related to an individual's beliefs about the object. The research of Rosenberg, Zajonc, Fishbein, and others has demonstrated that an individual's attitude (or affect) toward any object is a function of his beliefs about the object [12:320]

Thus, acceptance of the unidimensional view for the construct of attitude can be seen as pragmatic. Next, the

concept of organizational effectiveness will be explored.

Effectiveness

In investigating organizational effectiveness, the first task was to arrive at an acceptable definition. Georgopoulos and Tannenbaum feel that an acceptable definition must take into consideration two aspects: 1) the objectives of the organization and 2) the means through which they are obtained (14:179). The most important objectives of organizations as viewed by Georgopoulos and Tannenbaum are:

(1) High output in the sense of achieving the end results for which the organization is designed, whether quantitatively or qualitatively; (2) ability to absorb and assimilate relevant endogenous and exogenous changes, or the ability of the organization to keep up with the times without jeopardizing its integrity; and (3) the preservation of organizational resources, of human and material facilities [14:180-81].

Using these objectives, they then define organizational effectiveness in terms of the extent an organization as a social system, given certain resources and means, fulfills its objectives without incapacitating its means and resources, and without placing undue strain upon its members.

Attempts at defining organizational effectiveness have generally fallen into two categories: 1) the goal approach, and 2) the systems approach. Yuchtman and Seashore identified two assumptions that researchers using the goals approach must make. First, complex organizations have an ultimate goal and, second, the ultimate goal can be identified and progress toward the goal measured (43:146). In the goal approach, the assessment of effectiveness is derived by measuring an

organization's progress toward its goals. In light of the inability of past researchers to overcome the problems associated with these assumptions, Yuchtman and Seashore conclude that in the study of organizational effectiveness, "The goal approach has appeared as a hindrance rather than a help [43:149]."

The systems approach to organizational effectiveness can be derived from the open system model as it is applied to formal social organizations.

This model emphasizes the distinctiveness of the organization as an identifiable social structure or entity, and it emphasizes the interdependency processes that relate the organization to its environment. The first theme supports the idea of treating formal organizations not as phenomena incidental to individual behavior or societal functioning, but as entities appropriate for analysis as their own level. The second theme points to the nature of interrelatedness between the organization and its environment as the key source of information concerning organizational effectiveness [43:153].

Etzioni defines the system approach as the degree to which an organization realizes its goals under a given set of conditions, or put another way, how close the organizational allocation of resources approaches an optimum (11:36).

Using the systems approach and following general ideas of Georgopoulos and Mann, Mott defined organizational effectiveness as, "The ability of an organization to mobilize its centers of power for action - production and adaptation [19:17]." Effective organizations are ones that produce more and higher quality outputs and adapt more readily to environmental and internal problems than do other, similar organizations. This is the definition of organizational effectiveness which

was adopted for use in this research.

Research Objective

The objective of this research is to identify significant relationships between specific worker attitudes and specific effectiveness criteria in Environmental and Contract Planning Sections.

CHAPTER II

RESEARCH DESIGN AND METHODOLOGY

Overview

The research effort was divided into three phases. First, the population was defined. Next, methods for gathering data on organizational effectiveness and worker attitudes were selected. Finally, the data analysis techniques and procedures necessary to answer the research question were developed.

Population and Sample

The population under consideration included all base level Environmental and Contract Planning Sections located at bases within the continental United States. As discussed earlier, this represents a total population of about 400 people. Since this number was not too large, a census of the population was attempted. Questionnaires were distributed to each base in the population. The actual response achieved is discussed in Chapter III.

The Research Questionnaire

Since the population was dispersed over a large geographical area, a mailed instrument was determined to be the

most reasonable method for data collection. While a mailed instrument was the most practical in this case, it has two undesirable characteristics associated with its use. First, the sample collected may not be representative of the population since a large number of the questionnaires mailed may not be returned. This problem was minimized by attempting a census. Second, some questions may not be answered or may be incorrectly answered because they were misunderstood. To reduce the impact of this problem, it was decided to utilize previously validated questions to the maximum extent possible.

Effectiveness Data

Effectiveness was measured in the mailed questionnaire using five questions developed by Mott (19:205-07). Slight variations in wording were made to adapt the questions for use in this research. The five questions cover the following areas:

1. Quantity of output
2. Quality of output
3. Efficiency
4. Anticipating and solving problems
5. Flexibility

For statistical evaluation, the five areas listed above plus three others which were not appropriate for this research were grouped by Mott into the categories of productivity, adaptability, and flexibility. Indexes were then calculated by taking an average of the responses to several questions. That procedure was not followed in this research. Instead,

each of the five measures of effectiveness were used in a canonical analysis as dependent variables. Answers to the effectiveness questions were based on a five-point Likert scale. Numerical values were assigned to the responses as follows: A = 5, B = 4, C = 3, D = 2, and E = 1.

By computing product-moment correlations among the indexes of productivity, adaptability, and flexibility, Mott showed that the correlations were all positive, statistically significant, and that none explained more than 25 percent of the variance in the others (19:25). He concluded that the three indexes appeared to measure three different, but related, organizational processes.

Based on Mott's studies, it was assumed that the five effectiveness questions were valid measures of organizational effectiveness and no further effort to validate the questions was undertaken.

Attitude Data

The attitude questions used in the questionnaire were taken from a study of the relationship between attitude and organizational effectiveness in the Warner-Robins Air Logistics Center Maintenance Directorate by Engel (10:122-35). After conducting a factor analysis, Engel was able to identify 24 factors contained in the 94 attitude questions he used. Based on Engel's work, questions were selected for the questionnaire which was sent to the Environmental and Contract Planning Sections. As was the case with the effectiveness questions,

the answers to the attitude questions were assigned numerical values prior to the statistical analysis. The values assigned followed the same pattern as the effectiveness questions.

An attitude dimension which was not included in Engel's study, but of interest here, is alienation. Pearlin defines alienation as "subjectively experienced powerlessness to control one's own work activities [23:20]." Pearlin developed four questions to measure worker alienation. Price's review of the validity of these questions indicates that the results obtained by Pearlin appear to be consistent with other research work which has investigated the structural conditions that produce alienation (23:30). All four of these questions were included in the questionnaire. One question was omitted from the analysis, however, because it only had two possible responses. The three remaining alienation questions were factor analyzed with the other attitudinal questions.

Demographic Data

The questionnaire included a series of questions on the respondent's length of government service, educational background, and professional experience in environmental planning. Responses to these questions are included in Appendix F.

Analysis Plan

Analysis of the data provided by the questionnaire required that the large number of variables provided by the

attitude questions be reduced to a smaller, more manageable number of "factors." This was accomplished through factor analysis. The factors thus identified were then correlated with the previously identified measures of effectiveness using canonical analysis.

Data Level

The data obtained through the mailed questionnaire is, as a minimum, ordinal in scale. Since the data could not be strictly classified as interval level (21:4-5), a question as to the appropriateness of parametric statistics arose. Twenty five years ago, Siegel's works would have provided a fairly definitive answer to this question. Parametric techniques such as factor analysis are not acceptable for use on less than interval level data (13:46). However, arguments since that time concerning the issue of measurement scales and appropriate statistics have blurred the distinction between ordinal and interval level data. Many now argue that the use of parametric techniques for ordinal data is appropriate if the data at least approximates the interval scale. Reviewing the debate on the relationship between scales of measurement and appropriate statistics, Gardner concludes:

1. The distinction between ordinal and interval scales is not sharp. Many summated scales yield scores that, although not strictly of interval strength, are only mildly distorted versions of an interval scale.
2. Some of the arguments underlying the assertion that parametric procedures require interval strength statistics appear to be of doubtful validity.
3. Parametric procedures are, in any case, robust and

yield valid conclusions even when mildly distorted data are fed into them . . . [13:55].

It is assumed that this argument is valid and, therefore, the data analysis performed in this research depends extensively on parametric techniques.

Factor Analysis

Very simply put, factor analysis identifies a set of variables (factors) which account for the variation in a larger set of variables (31:242). As applied to the questionnaire, this reduced the large number of attitude question (forty seven) to a smaller, more comprehensive number of factors (ten). This part of the analysis was performed using the FACTOR subroutine of the Statistical Package for the Social Sciences (SPSS) computer program (21:468-514). The computer calculates the factors but does not interpret what the factors are measuring. This must be done by the user. To facilitate this identification, a process known as orthogonal varimax rotation was used to present the factors in a more discernable form (10:35). Orthogonal varimax rotation simplifies the factors by reducing as many values in each column as close to zero as possible (21:484). Varimax rotation loads fewer variables on each factor than the other available rotation methods, thereby easing factor identification (21:485). The output from this procedure is a factor matrix. This is a matrix of correlations among observed variables and latent factors (21:259). The factor loadings are the numerical values in the factor matrix and represent the degree of

TABLE I
Orthogonally Rotated Factors
(8:36)

| Question | Factors | | Communality |
|---------------|---------|------|-------------|
| | A | B | |
| 1 | .23 | .78 | .66 |
| 2 | .18 | .82 | .70 |
| 3 | .78 | .18 | .64 |
| 4 | .77 | .14 | .61 |
| 5 | .25 | .75 | .63 |
| 6 | .78 | .21 | .66 |
| Eigenvalue | 1.96 | 1.94 | 3.90 |
| % of Variance | .33 | .32 | .65 |

correlation between a variable and a factor.

Table I shows a simple factor matrix. Questions 1 through 6 are the observed variables. In the table, Question 1 has a factor loading of .23 on Factor A and .78 on Factor B. The variation in Question 1 accounted for by Factor A is $(.23)^2$ or .05, which is 5 percent. The total variance of Question 1 accounted for by all factors is called the communality. For Question 1, the communality is $(.23)^2 + (.78)^2 = .05 + .61 = .66$.

The eigenvalue of Factor A is 1.96. This is determined by summing the squares of the factor loadings for each question on the factor. This is analogous to the procedure used to calculate the communality, except instead of summing squares across the rows, they are summed down the columns. The

eigenvalue represents the amount of variance in the data that a factor accounts for. The percent of total variance in the data accounted for by Factor A is $1.96/6 = 0.33$. Therefore, Factor A accounts for 33 percent of the total variance in the data and Factor B for 32 percent. Together, they account for 65 percent of the total variance in the data. This means that 35 percent of the data is not explained.

Engel states that only factors with eigenvalues greater than 1.0 are normally considered meaningful (10:34). In this research, the SPSS default minimum eigenvalue of 1.0 was used. Using this default criteria, factors with eigenvalues less than 1.0 are deleted by the SPSS program (21:493).

The most difficult step in the factor analysis process is identification of the factor meanings. This was subjectively performed by analyzing the questions associated with each factor and identifying the underlying characteristic common to those questions. The highest loading questions for each factor in the varimax rotated factor matrix were used in interpreting the factors.

The FACTOR subroutine also computes the factor score coefficients for each question in each factor. These coefficients indicate the weight that each question has in determining each factor. These coefficients are then multiplied by the numerical values assigned to the responses of each respondent to produce individual factor scores. Each respondent's set of factor scores is then correlated with the effectiveness measures during the canonical correlation portion

of the data analysis. The factor scores indicate the degree that the individual scored high on the questions that loaded high on each individual factor (1:224).

Variables

The factors identified by the factor analysis procedure were designated the independent variables. The perceived measures of effectiveness were designated the dependent variables.

Canonical Analysis

The canonical analysis was performed using the SPSS subroutine CANCORR (21:515-27). Canonical analysis is defined by Thorndike as ". . . a technique for finding the correlations between one set of variables, taken as a set, and a second set of variables also taken as a set [31:175]." Thus, canonical analysis is a correlation technique for finding the interrelationships between the variables in two or more sets of data. In this effort, one data set consisted of the five measures of effectiveness, and the second data set consisted of the attitude factors.

As an example of canonical analysis, assume that a factor analysis has already been done and that four factors, FAC1 to FAC4, have been identified. If the factor scores from these four factors, taken as a set, are canonically correlated with five other variables, VAR1 to VAR5, also taken as a set, the result may look something like Table II.

TABLE II
Sample Canonical Correlation Output

| Number | Significance | |
|--|--------------|---------|
| 1 | 0.000 | |
| 2 | 0.000 | |
| 3 | 0.072 | |
| 4 | 0.529 | |
| ----- | | |
| Coefficients for Canonical Variables of the Second Set | | |
| | CANVAR1 | CANVAR2 |
| FAC1 | .72924 | .29453 |
| FAC2 | .68902 | .64392 |
| FAC3 | .12592 | .49583 |
| FAC4 | .29735 | .19476 |
| ----- | | |
| Coefficients for Canonical Variables of the First Set | | |
| | CANVAR1 | CANVAR2 |
| VAR1 | .65415 | .24374 |
| VAR2 | .10239 | .77982 |
| VAR3 | .51087 | .20919 |
| VAR4 | .76691 | .50671 |
| VAR5 | .06486 | .08499 |

Of the four correlations identified in Table II, only two have a statistical significance better than 0.05, hence only those two relationships have canonical coefficients produced (21:520). The interpretation of Table II for canonical

variable 1 (CANVAR1) is that whenever FAC1 and FAC2 are found, VAR1, VAR2, and VAR3 will also be found. That is, there is a relationship between FAC1 and FAC2 taken as a set, and VAR1, VAR2, and VAR3, also taken as a set (21:518).

Independent of the first relationship is another relationship between both sets - CANVAR2. The canonical coefficients listed for the second canonical variable indicates that there is a significant relationship between the set FAC2 and FAC3, and the set VAR2 and VAR4.

When analyzing canonical coefficients, the determination between which variables load "high enough" and which variables are insignificant is not usually clear or precise. The relationship between the two sets of data is more sensitive to those variables with the higher canonical coefficients. Therefore, the analysis of the canonical output is based upon the relative magnitude of the canonical coefficients.

Limitations

Care should be exercised before the results of this study are applied by management to actual situations. These results do not apply to any one specific organization. Rather, they were derived from a large sample taken from many bases. Further, it must be stressed that the relationships derived do not necessarily indicate causality. The relationships found may be either dependent on some other, unidentified cause or may not, in reality, be related at all. The probability of the latter event having been set at 0.05.

Therefore, attempts to increase effectiveness in an organization by modifying attitudes should be tempered with a fair amount of judgment.

CHAPTER III

ANALYSIS OF THE DATA

The data analysis was conducted in three parts. The questionnaire responses were reviewed first. A factor analysis of the attitude data followed. And finally, a canonical correlation analysis between the attitude factors and the effectiveness questions was performed.

Results of the Questionnaire

Three hundred twenty-six questionnaires were distributed to 76 bases in the continental United States. A total of 270 questionnaires were answered and returned. Of this total, 262 useable responses were received. Each base was sent one questionnaire over and above the number of authorized positions in the Environmental and Contract Planning Section. Since the exact number of authorizations which were actually filled at the time the questionnaires were mailed was unknown, it was not possible to determine a response rate. The researchers estimate, however, that the 270 which were received represent 70 to 80 percent of the target population.

A copy of the survey instrument is included in Appendix A. Appendix B lists the means and standard deviations of the responses for the attitude and effectiveness questions.

Factor Analysis

The attitude data, questions 11-43 and 45-53, were factor analyzed using the FACTOR subprogram contained in the Statistical Package for the Social Sciences, version 7.0. The computer program is shown in Appendix C. Question 44 was deleted from the analysis since there were only two possible responses and this may have produced undesirable results when factor analyzed. The VARIMAX rotation option was selected and ten factors were extracted. This number was controlled by the pre-selection of 1.0 as the minimum acceptable eigenvalue for each factor. The ten factors produced account for a total of 65.8 percent of the total variance in the attitude data. Table III shows the eigenvalue and the percent of variance accounted for by each factor. Appendix D contains the complete VARIMAX rotated factor matrix.

Once the rotated factor matrix was obtained, the next step was to interpret each factor. To simplify this procedure, the questions which loaded into each factor were listed based on their factor loadings. The highest loading question was listed first, and the others followed in decreasing order. Only questions with correlations greater than 0.20 were used to interpret the factors. The five highest loading questions (or fewer if there were less than five with correlations over 0.20) are listed for each of the factors. A discussion of meaning of each factors follows the list of the highest loading questions. The factors are presented in decreasing order

TABLE III

Eigenvalues and Percent of Variance
Accounted For By Each Factor Using
Principal Factor With Iterations

| Factor | Eigenvalue | Percent of Variance | Cumulative Percent |
|--------|------------|------------------------|-----------------------|
| 1 | 13.90 | 33.1 | 33.1 |
| 2 | 2.95 | 7.0 | 40.1 |
| 3 | 2.13 | 5.1 | 45.2 |
| 4 | 1.53 | 3.6 | 48.8 |
| 5 | 1.44 | 3.4 | 52.2 |
| 6 | 1.27 | 3.0 | 55.3 |
| 7 | 1.19 | 2.8 | 58.1 |
| 8 | 1.13 | 2.7 | 60.8 |
| 9 | 1.05 | 2.5 | 63.3 |
| 10 | 1.03 | 2.5 | 65.8 |

based on the percentage of variance each explains.

Factor 1

| <u>Loading</u> | <u>Question</u> |
|----------------|---|
| .842 | 53 I enjoy my job. |
| .823 | 24 Everything considered, my job is very satisfactory. |
| .745 | 16 How much satisfaction do you gain from the performance of your job? |
| .664 | 18 Do you have a sense or feeling of achievement? |
| .663 | 30 I would describe my job as . . . |

Factor 1, which accounted for 33.1 percent of the variance in the attitude data, was the most easily interpreted factor. All of the questions in Factor 1 deal with the individual's satisfaction with the job.

Factor 2

| <u>Loading</u> | | <u>Question</u> |
|----------------|----|---|
| .767 | 40 | Do you feel decisions are made at the proper level of management? |
| .722 | 38 | How often do you feel that the right decisions are made at upper levels of management? |
| .542 | 36 | Do you feel that upper levels of management understand the problems you face in doing your job? |
| .493 | 13 | Identified job problems are quickly resolved by management. |
| .491 | 41 | Meaningful organizational goals have been established for work. |

Questions 40 and 38 deal with management decision-making.

Questions 36 and 13 are concerned with problem-solving by management. The three highest loading questions are also concerned with the level of management at which decisions are made. It seems clear that Factor 2 measures satisfaction with the decision-making structure.

Factor 3

| <u>Loading</u> | | <u>Question</u> |
|----------------|----|---|
| .849 | 32 | The people in my section work together effectively as a team. |
| .749 | 34 | Communication within my section is good. |

| | | |
|------|----|--|
| .597 | 49 | The other members of my section know what their jobs are and know how to do them well. |
| .538 | 33 | Do you feel your fellow workers are working at their full capacity? |
| .367 | 50 | My immediate supervisor usually tells me what is going on at higher levels of base management. |

The questions included in Factor 3 deal with how the group functions. As a set, these questions measure group cohesiveness. Included in the group cohesiveness concept are the individual's satisfaction with the group's teamwork and communication and with the other members' job skills and amount of individual effort.

Factor 4

| <u>Loading</u> | | <u>Question</u> |
|----------------|----|--|
| .780 | 37 | Do you feel your immediate supervisor knows and understands the problems you have in doing your job? |
| .532 | 50 | My immediate supervisor usually tells me what is going on at the higher levels of base management. |
| .370 | 12 | I am satisfied with the feedback I receive in doing my job. |
| .298 | 36 | Do you feel that upper levels of management understand the problems you face in doing your job? |
| .293 | 47 | The different tasks my section has to do are interdependent; each task is highly related to the other tasks. |

Most of these questions involve both the supervisor and communication. Questions 37 and 36 involve problem-solving, while Questions 50, 12, and 47 deal with information flow.

Taken together, these ideas suggest that Factor 4 measures the degree of confidence a worker has in management. Therefore, Factor 4 is labeled confidence in management.

Factor 5

| <u>Loading</u> | <u>Question</u> |
|----------------|--|
| -.629 | 14 Do you feel that pressure is used to obtain increased production? |
| -.569 | 52 Personnel turnover has hurt the ability of my section to accomplish its task. |
| .316 | 27 I receive the necessary amount of training to do my job well. |
| .242 | 35 Communication between my section and the BCE are good. |
| .242 | 28 I have the necessary authority to carry out my job. |

Factor 5 seems to measure the overall organizational climate. Organizational climate is a concept which attempts to aggregate many qualities of an organization to describe the overall working environment. In this case, the factor analysis has produced a set of questions defining organizational climate in terms of the amount of pressure used to obtain a high production rate, the turnover rate, individual job training, communications, and the amount of authority given each worker to enable him to carry out his job.

Factor 6

| <u>Loading</u> | <u>Question</u> |
|----------------|---|
| .476 | 26 My skills and abilities are being used to the fullest at my present job. |

| | | |
|-------|----|--|
| -.445 | 17 | How often have you felt unable to use your full capabilities in the performance of your job? |
| .354 | 22 | How many parts of your job would you change if allowed to do so? |
| .309 | 43 | How often do you do things in your work that you wouldn't otherwise do if it were up to you? |
| .308 | 31 | What part of your job could be performed by a person having less skill than you? |

The common theme in these questions is the job. Worker's capabilities are also assessed by Questions 17, 26, and 31. This, together with the idea of job content contained in Questions 22 and 43, lead to the conclusion that this factor describes satisfaction with job fit.

Factor 7

| <u>Loading</u> | | <u>Question</u> |
|----------------|----|--|
| .574 | 51 | My section receives little information about what is going on in other organizations on base. |
| .441 | 45 | How much say or influence do people like you have on the way the base is run? |
| .328 | 35 | Communication between my section and the BCE are good. |
| .241 | 50 | My immediate supervisor usually tells me what is going on at the higher levels of base management. |
| .232 | 12 | I am satisfied with the feedback I receive in doing my job. |

The overall communication process on the base is described by Factor 7. While several factors have an element of communications in them, Factor 7 deals with communications

exclusively. Included are the ideas of communication with other organizations (Question 51), communication with base level managers (Questions 45 and 35), and communications involving the supervisor (Questions 50 and 12). Since the communications process over various levels of the organization is addressed by the questions loading into Factor 7, the selected interpretation is logical.

Factor 8

| <u>Loading</u> | | <u>Question</u> |
|----------------|----|---|
| .599 | 29 | I am allowed to use my own judgment on the job. |
| .379 | 28 | I have the necessary authority to carry out my job. |
| .273 | 45 | How much say or influence do people like you have on the way the base is run? |
| .254 | 11 | My supervisor gives me responsibility in line with my abilities. |
| .222 | 14 | Do you feel that pressure is used to obtain increased production? |

While there were relatively few questions which loaded highly, the meaning of Factor 8 was still quite clear. Each of the first four questions deals with the amount of responsibility, authority, or judgment involved with the job. Question 14, which deals with the use of pressure to increase production, is related to authority in that when pressure is used, the authority of the worker is diminished. Thus, the common theme of Factor 8 is the degree of responsibility and authority that the individual believes he has in his job.

Factor 9

| <u>Loading</u> | <u>Question</u> |
|----------------|---|
| .741 | 48 My job has many complex tasks requiring advanced education or training. |
| .537 | 25 My grade is too low for the work I do. |
| .428 | 42 My work objectives require a great deal of effort on my part to complete. |
| .423 | 31 What part of your job could be performed by a person having less skill than you? |
| .393 | 20 Your work assignment is challenging. |

The meaning of Factor 9 quickly becomes apparent upon reading the questions. Every question contains either the word job or work. Rereading the questions to pick out the other common elements produces words such as complex, effort, skill and challenging. Thus, Factor 9 describes job complexity.

Factor 10

| <u>Loading</u> | <u>Question</u> |
|----------------|--|
| .533 | 19 Your present job assignment offers the opportunity for future advancement. |
| .328 | 21 How often would you encourage others to seek a job like yours? |
| .248 | 51 My section receives little information about what is going on in other organizations on base. |
| .220 | 22 How many parts of your job would you change if allowed to do so? |

The degree of job desirability seems to be what is being measured by this factor. The problem encountered in interpreting

Factor 10 was that question 51 really does not fit with the other questions. Since its loading (.248) is low when compared with the loadings in other factors, it was decided that question 51 could be safely ignored in interpreting the factor.

The interpretation given to each factor is subjective and undoubtedly other interpretations could be selected for many of the factors. The interpretations given here are consistent with the interpretations for similar factors in studies employing the same set of questions. Table IV is a list of the interpretations given to each of the ten attitude factors.

TABLE IV
Factor Interpretations

| Factor | Interpretation |
|--------|---|
| 1 | Individual satisfaction with the job |
| 2 | Satisfaction with the decision-making structure |
| 3 | Group cohesiveness |
| 4 | Confidence in management |
| 5 | Organizational climate |
| 6 | Satisfaction with job fit |
| 7 | Overall communication process |
| 8 | Responsibility and authority |
| 9 | Job complexity |
| 10 | Job desirability |

Canonical Correlation Analysis

The research question of interest in this study involves identifying significant relationships which may exist between worker attitudes and specific organizational effectiveness criteria. Now that the ten attitude factors are available, a canonical correlation analysis will be used to identify the statistically significant relationships between the attitude factors and the five measures of effectiveness contained in the questionnaire.

In order to determine the nature of a canonical relationship, the algebraic sign and magnitude of the canonical loading must be considered. To determine the significance an algebraic sign will have in interpreting the canonical correlations, it was necessary to review the factor loadings and mean scores for the highly loaded questions on each factor. The directional interpretations of the attitude factors are given in Table V. Using a similar procedure, directional interpretations for the effectiveness questions were determined and are given in Table VI.

The canonical analysis was performed using the CANCELL subprogram in the Statistical Package for the Social Sciences, version 7.0. A relationship was considered statistically significant if it had a significance level of 0.05 or better. Based on this criteria, two significant canonical relationships between the attitudinal factors and the five effectiveness questions were found. The relationship which explains

TABLE V
Directional Interpretations of the
Attitude Factors

| Factor | Sign of Significant Loading | Interpretation |
|--------|-----------------------------|--|
| 1 | + | High satisfaction with work |
| | - | Low satisfaction with work |
| 2 | + | High satisfaction with decision-making structure |
| | - | Low satisfaction with decision-making structure |
| 3 | + | High group cohesiveness |
| | - | Low group cohesiveness |
| 4 | + | High confidence in management |
| | - | Low confidence in management |
| 5 | + | Good organizational climate |
| | - | Poor organizational climate |
| 6 | + | High satisfaction with job fit |
| | - | Low satisfaction with job fit |
| 7 | + | Good overall communication |
| | - | Poor overall communication |
| 8 | + | High amount of responsibility and authority |
| | - | Low amount of responsibility and authority |
| 9 | + | High job complexity |
| | - | Low job complexity |
| 10 | + | High job desirability |
| | - | Low job desirability |

TABLE VI
Directional Interpretations of the
Effectiveness Questions

| Question | Sign of Significant Loading | Interpretation |
|----------|-----------------------------|-----------------------------------|
| 6 | + | High production quantity |
| | - | Low production quantity |
| 7 | + | High production quality |
| | - | Low production quality |
| 8 | + | Low efficiency |
| | - | High efficiency |
| 9 | + | Good job of anticipating problems |
| | - | Poor job of anticipating problems |
| 10 | + | Low flexibility |
| | - | High flexibility |

the greatest amount of the variance in the data is presented first. The complete listing of the canonical analysis is contained in Appendix E.

Relationship 1

| <u>Eigenvalue</u> | <u>Canonical Correlation Coefficient</u> | <u>Statistical Significance</u> |
|-------------------|--|---------------------------------|
| 0.53749 | .73314 | Better than .001 |
| <u>Loading</u> | <u>Factor</u> | <u>Factor Interpretation</u> |
| .787 | 3 | High group cohesiveness |
| | <u>Question</u> | <u>Question Interpretation</u> |
| .303 | 7 | High production quality |
| -.263 | 10 | High flexibility |

| <u>Loading</u> | <u>Question</u> | <u>Question Interpretation</u> |
|----------------|-----------------|-----------------------------------|
| .255 | 9 | Good job of anticipating problems |
| -.233 | 8 | High efficiency |
| .207 | 6 | High production quantity |

Interpretation: This relationship implies that sections where there is

1. high group cohesiveness

are also section where there is

1. High production quality
2. High flexibility
3. Good job done in anticipating problems
4. High efficiency
5. High production quantity

Relationship 1 is significant for several reasons.

First, group cohesiveness has been shown to be positively related to all five measures of effectiveness. This suggests that while group cohesiveness is not highly correlated to any one measure of effectiveness, it may be an important factor in determining the overall effectiveness of the Environmental and Contract Planning function. The group cohesiveness factor, it will be remembered, is comprised of questions which involve teamwork, communication within the section, and individual job knowledge and effort. It should be noted that there is a significant absence of some of the other attitude factors which are often thought to be highly correlated to overall effectiveness, such as job satisfaction. This relationship, along

with Relationship 2, is consistent with the theory that worker attitudes are, in fact, directly related to organizational effectiveness.

Relationship 2

| <u>Eigenvalue</u> | <u>Canonical Correlation Coefficient</u> | <u>Statistical Significance</u> |
|-------------------|--|---------------------------------------|
| .14916 | .38621 | Better than .001 |
| <u>Loading</u> | <u>Factor</u> | <u>Factor Interpretation</u> |
| -.661 | 5 | Poor organizational climate |
| .421 | 8 | High responsibility and authority |
| -.389 | 2 | Low satisfaction with decision-making |
| | <u>Question</u> | <u>Question Interpretation</u> |
| 1.121 | 6 | High production quantity |
| -.758 | 9 | Poor anticipation of problems |

Interpretation: This relationship indicates that in sections where there is

1. Poor organizational climate
2. High responsibility and authority
3. Low satisfaction with the decision-making structure

we can expect to find

1. High production quantity
2. Poor anticipation of problems

Relationship 2 is both less significant than Relationship 1 and more difficult to describe. The set of attitude factors (poor organizational climate, high responsibility, and low

.....

satisfaction with the decision-making structure) indicates an unhappiness with management. The high level of responsibility suggests that skilled craftsmen or professional employees such as engineers or accountants are involved. This is not surprising when the environmental planning function is considered. For the tasks identified in Chapter I to be accomplished effectively, the Environmental and Contract Planning Section must employ skilled or professional workers. These workers are typically expected to exhibit a large degree of responsibility for their individual output. It would appear that the professional employee being described is disillusioned with the work environment.

The canonical relationship identified also indicates that in an organization where this combination of attitude factors is present, high production quantity and poor anticipation of problems will be found. This means that the employee meets his professional responsibilities for quantity of output. Additionally, this relationship shows that the planner does a poor job of anticipating problems. This combination of high production quantity and poor anticipation of problems indicates that the planners are so busy with day-to-day requirements that little time is available for their longer-range planning activities.

Thus, Relationship 2 seems to be describing a situation in which motivated professional employees working in an unfavorable environment are able to handle a large work load, but are not effective performing the planning function. This

.....
situation is cause for concern and presents a real challenge
for management to correct.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER RESEARCH

Summary

The problem this study addresses concerns the effective management of the Air Force's Environmental and Contract Planning effort. For this effort to be successful, a multidisciplinary team of specialists must work in close cooperation with each other at each base. To effectively manage this effort, the leaders responsible for it must understand the factors which contribute to or detract from a successful multidisciplinary effort. To increase their understanding, this study explores the significant relationships which exist between specific worker attitudes and specific measures of organizational effectiveness.

Organizational effectiveness was measured using five questions developed by Mott (18:205-07). Each question explores a different dimension of overall effectiveness. The dimensions addressed were:

1. Quantity of output
2. Quality of output
3. Efficiency
4. Anticipating and solving problems
5. Flexibility

Worker attitudes were measured using a series of questions taken from a study by Engel (9:122-35) of the Warner-Robins Air Logistics Center Maintenance Directorate.

The two sets of questions were combined into a questionnaire which was distributed to the Environmental and Contract Planning Sections at 76 bases in the United States. A total of 262 useable responses were obtained.

To reduce the number of attitude variables which had to be considered, the 42 attitude questions were factor analyzed. The factor analysis produced 10 factors.

Canonical correlation analysis was then used to determine what relationships between the attitude factors and the effectiveness measures exist.

Conclusions

The objective of this research effort was to identify relationships between worker attitudes and effectiveness criteria. Two such relationships were found.

Relationship 1, which was the stronger relationship, has a canonical correlation coefficient of 0.73. In it, group cohesiveness was shown to be positively correlated with each of the five measures of organizational effectiveness used in this study. Thus, the value of Relationship 1 is that it tells us that group cohesiveness is positively related to overall effectiveness, and that an improvement in organizational climate will tend to produce an improvement in the overall effectiveness of an Environmental and Contract Planning Section.

Relationship 2, with a canonical correlation coefficient of 0.39, is not as strong as Relationship 1. While Relationship 1 was relatively simple, Relationship 2 is complex. Poor organizational climate, high job responsibility, and low satisfaction with the decision-making structure have been shown to indicate that high production quantity and poor anticipation of problems will also be found. This relationship shows that the effects of worker attitudes on effectiveness are not necessarily simple or intuitive.

Having identified these relationships, management may not yet be able to use them to improve management practices. The reason for this is that while this research has established the existence of these relationships, the causality among the variables has not been established. While this is not a problem in Relationship 1, the complexity of Relationship 2 makes an explanation of cause and effect difficult. Since Relationship 2 might be viewed as disturbing by management, additional research into this relationship may be in order. On the positive side, having established that worker attitudes are indeed related to effectiveness, and also having determined some of the attitudes which are important in the Environmental and Contract Planning function affords management insight which was previously unavailable.

Recommendations for Further Research

In using canonical correlation analysis, it was not possible to determine causality in the relationships between

worker attitudes and perceived effectiveness. Further research into the causality would provide management with additional understanding into which attitudes can be modified to increase effectiveness, while not causing unwanted effects elsewhere.

Another area for additional research would be to examine how the results of Mott's effectiveness questions, which were used in this study, would correlate to other measures of effectiveness which are available. Other effectiveness measures which might be considered include Operational Readiness Inspection (ORI) results, comments from management assistance teams, and different types of questionnaires. This would not only further clarify the relationships found here, but also would provide useful information on the validity of the effectiveness measures now being used and how they could be improved.

APPENDIX A
WORKER ATTITUDES AND ORGANIZATIONAL
EFFECTIVENESS SURVEY

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (ATC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433



REPLY TO
ATTN OF:

15 February 1980
LS (1st Lt Baxley/1st Lt Salomon/AUTOVON 785-4437)

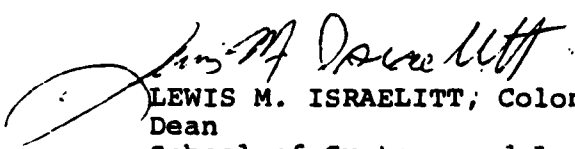
SUBJECT

Worker Attitudes and Organizational Effectiveness in Base
Level Environmental and Contract Planning Sections
Questionnaire

TO:

CES/Environmental and Contract Planning Section

1. The attached questionnaires were prepared by a research team at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. The purpose of the questionnaire is to acquire data concerning worker attitudes and perceived effectiveness of the section.
2. Please distribute a questionnaire to the section chief and each environmental, contract, natural resources, and community planner. Each respondent should provide an answer for each question.
3. A valid study cannot be conducted without your help. Your participation is strictly voluntary. Your cooperation in providing the information will be appreciated and will be beneficial in evaluating Air Force Environmental and Contract Planning. This survey has been reviewed and approved by HQ USAF and has been designated USAF SCN 80-54.
4. Please remove this cover sheet before returning the completed questionnaire. Each questionnaire should be returned in its attached envelope within one week after receipt.


LEWIS M. ISRAELITT, Colonel, USAF
Dean
School of Systems and Logistics

- 3 Atch
1. Questionnaire
 2. Answer Sheet
 3. Return Envelope

PRIVACY ACT STATEMENT

In accordance with paragraph 8 AFR 12-35, the following information is provided as required by the Privacy Act of 1974.

a. Authority

(1) 10 USC 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or

(2) 5 USC 301, Departmental Regulations; and/or

(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Programs;

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine uses. The survey data will be converted to information for use in research and management related problems. Results of the research, based on the data provided, will be included in a written doctoral dissertation and/or master's theses, and may also be included in published articles, reports, or texts. Distribution of the results of the research based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any part or all of this survey.

.....

Please answer the questions on the following pages as honestly as possible. Indicate how you really feel about the subject. In no way will your responses be traceable to you, nor will any attempt be made to do so. The information you provide will be used to improve base level environmental planning.

Keep in mind that this is not a test and that there are no "right" or "wrong" answers. Thank you for taking time to answer these questions.

WORKER ATTITUDES AND ORGANIZATIONAL EFFECTIVENESS IN BASE
LEVEL ENVIRONMENTAL AND CONTRACT PLANNING SECTIONS

Please mark your responses to the following questions on the
machine scorable sheet with a number 2 pencil.

SECTION I

1. What is your major command?
 - a. AFPC
 - b. MAC
 - c. SAC
 - d. TAC
 - e. Other
2. What is your rank? (military only - otherwise leave blank)
 - a. Major
 - b. Captain
 - c. 1st Lieutenant
 - d. 2nd Lieutenant
 - e. Other
3. What is your grade? (civilian only - otherwise leave blank)
 - a. GS-12
 - b. GS-11
 - c. GS-09
 - d. GS-07
 - e. Other
4. How long have you worked for the Air Force?
 - a. less than 1 year
 - b. 1 year but less than 2 years
 - c. 2 years but less than 4 years
 - d. 4 years but less than 10 years
 - e. 10 years or more
5. How long have you worked in your current job?
 - a. less than 6 months
 - b. 6 months but less than 1 year
 - c. 1 year but less than 2 years
 - d. 2 years but less than 4 years
 - e. 4 years or more

SECTION II

Every worker produces something in his work. It may be a "product" or a "service". But sometimes it is very difficult to identify the products or services. Below are listed some of the products and services being produced in the Environmental and Contract Planning Section.

| | |
|--------------------------|-------------------------------|
| Environmental statements | Explosives safety criteria |
| Fish and Wildlife Plan | Forestry Plan |
| Comprehensive Plan | Environmental studies |
| Outdoor Recreation Plan | Endangered species protection |
| AICUZ | Contract programming |

We would like you to think carefully of the things that you produce in your work and of the things produced by those people who work around you in your section.

6. Thinking now of the various things produced by the people in your section, how much are they producing?
 - a. Their production is very high
 - b. It is fairly high
 - c. It is neither high nor low
 - d. It is fairly low
 - e. It is very low
7. How good would you say is the quality of the products or services produced by the people in your section?
 - a. Their products or services are of excellent quality
 - b. Good quality
 - c. Fair quality
 - d. Their quality is not too good
 - e. Their quality is poor
8. Do the people in your section seem to get maximum output from the resources they have available? That is, how efficiently do they do their work?
 - a. They do not work efficiently at all
 - b. Not too efficient
 - c. Fairly efficient
 - d. They are very efficient
 - e. They are extremely efficient

9. How good a job is done by the people in your section in anticipating problems that may come up in the future and preventing them from occurring or minimizing their effects?
- a. They do an excellent job in anticipating problems
 - b. They do a very good job
 - c. A fair job
 - d. Not too good a job
 - e. They do a poor job in anticipating problems
10. From time to time emergencies arise, such as crash programs or schedules moved ahead. When these emergencies occur, they cause work overloads for many people. Some work groups cope with these emergencies more readily and successfully than others. How good a job do the people in your section do in coping with these emergencies?
- a. They do a poor job in handling emergency situations
 - b. They do not do very well
 - c. They do a fair job
 - d. They do a good job
 - e. They do an excellent job of handling these situations

SECTION III

11. My supervisor gives me responsibility in line with my abilities.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
12. I am satisfied with the feedback I receive in doing my job.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no

13. Identified job problems are quickly resolved by management.
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never
14. Do you feel that pressure is used to obtain increased production?
- a. Very much
 - b. Much
 - c. Some
 - d. Little
 - e. Very little
15. Do you feel that decisions which affect your job are based on technical or engineering analyses?
- a. Very much
 - b. Much
 - c. Some
 - d. Little
 - e. Very little
16. How much satisfaction do you gain from the performance of your job?
- a. Very much
 - b. Much
 - c. Some
 - d. Little
 - e. Very little
17. Think about the specific duties of your job. How often have you felt unable to use your full capabilities in the performance of your job?
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never
18. In thinking about your job - do you have a sense or feeling of achievement?
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never

19. Your present job assignment offers the opportunity for future advancement.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
20. Your work assignment is challenging.
- a. Almost all of the time
 - b. Very often
 - c. Half the time
 - d. Seldom
 - e. Almost never
21. How often would you encourage others to seek a job like yours?
- a. Almost always
 - b. Very often
 - c. Sometimes
 - d. Very seldom
 - e. Almost never
22. How many parts of your job would you change if allowed to do so?
- a. None
 - b. Very few
 - c. Half of them
 - d. Most of them
 - e. Almost all of them
23. I dread going to work.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
24. Everything considered, my job is very satisfactory.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no

25. My grade is too low for the work I do.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
26. My skills and abilities are being used to the fullest at my present job.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
27. I receive the necessary amount of training to do my job well.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
28. I have the necessary authority to carry out my job.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
29. I am allowed to use my own judgement on the job.
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never
30. I would describe my job as
- a. Interesting
 - b. Demanding my best abilities and skills
 - c. Allowing me to contribute innovative ideas
 - d. Satisfactory
 - e. Dull, uninteresting

31. What part of your job could be performed by a person having less skill than you?
- a. 20%
 - b. 35%
 - c. 50%
 - d. 70%
 - e. 100%
32. The people in my section work together effectively as a team.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
33. Do you feel your fellow workers are working at their full capacity?
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
34. Communication within my section is good.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
35. Communication between my section and the BCE are good.
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
36. Do you feel that upper levels of management understand the problems you face in doing your job?
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no

37. Do you feel your immediate supervisor knows and understands the problems you have in doing your job?
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
38. How often do you feel that the right decisions are made at upper levels of management?
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never
39. How often do you feel that the right decisions are made at lower levels of management?
- a. Always
 - b. Usually
 - c. Sometimes
 - d. Infrequently
 - e. Never
40. Do you feel decisions are made at the proper level of management?
- a. Definitely yes
 - b. Mostly yes
 - c. Sometimes
 - d. Mostly no
 - e. Definitely no
41. Meaningful organizational goals have been established for work.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
42. My work objectives require a great deal of effort on my part to complete.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree

43. How often do you do things in your work that you wouldn't otherwise do if it were up to you?
- a. Never
 - b. Once in a while
 - c. Fairly often
 - d. Very often
44. Around here, it's not important how much you know; it's who you know that really counts.
- a. Agree
 - b. Disagree
45. How much say or influence do people like you have on the way the base is run?
- a. A lot
 - b. Some
 - c. Very little
 - d. None
46. How often do you tell your superior your ideas about things you might do in your work?
- a. Never
 - b. Once in a while
 - c. Fairly often
 - d. Very often
47. The different tasks my section has to do are interdependent; each task is highly related to the other tasks.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
48. My job has many complex tasks requiring advanced education or training.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree

49. The other members of my section know what their jobs are and know how to do them well.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
50. My immediate supervisor usually tells me what is going on at the higher levels of base management.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
51. My section receives little information about what is going on in other organizations on base.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
52. Personnel turnover has hurt the ability of my section to accomplish its tasks.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree
53. I enjoy my job.
- a. Strongly agree
 - b. Agree
 - c. Undecided
 - d. Disagree
 - e. Strongly disagree

THANK YOU FOR YOUR COOPERATION IN COMPLETING THIS QUESTIONNAIRE. PLEASE ENCLOSE THE QUESTIONNAIRE AND THE MACHINE SCORABLE SHEET IN THE RETURN ENVELOPE AND PLACE THE ENVELOPE IN OUTGOING OFFICIAL MAIL.

APPENDIX B
MEANS, STANDARD DEVIATIONS, AND
NUMBER OF RESPONDENTS (CASES)

| Variable | Mean | Standard Dev | Cases |
|----------|-------|--------------|-------|
| VAR006 | 4.034 | 0.813 | 262 |
| VAR007 | 4.191 | 0.723 | 262 |
| VAR008 | 2.298 | 0.886 | 262 |
| VAR009 | 3.691 | 0.983 | 262 |
| VAR010 | 1.824 | 0.926 | 262 |
| VAR011 | 4.215 | 0.988 | 261 |
| VAR012 | 3.500 | 1.174 | 262 |
| VAR013 | 3.298 | 0.961 | 262 |
| VAR014 | 2.580 | 1.307 | 262 |
| VAR015 | 3.027 | 1.213 | 260 |
| VAR016 | 3.588 | 1.209 | 262 |
| VAR017 | 3.015 | 0.935 | 262 |
| VAR018 | 3.439 | 0.952 | 262 |
| VAR019 | 2.515 | 1.228 | 262 |
| VAR020 | 3.458 | 1.049 | 262 |
| VAR021 | 2.935 | 1.065 | 262 |
| VAR022 | 3.202 | 0.939 | 262 |
| VAR023 | 2.233 | 1.019 | 262 |
| VAR024 | 3.538 | 1.071 | 262 |
| VAR025 | 3.279 | 1.374 | 262 |
| VAR026 | 2.756 | 1.101 | 262 |
| VAR027 | 3.103 | 1.203 | 261 |
| VAR028 | 3.241 | 1.197 | 262 |
| VAR029 | 3.699 | 0.829 | 262 |
| VAR030 | 3.177 | 1.465 | 260 |

| Variable | Mean | Standard Dev | Cases |
|----------|-------|--------------|-------|
| VAR031 | 3.804 | 1.244 | 260 |
| VAR032 | 4.076 | 0.956 | 262 |
| VAR033 | 3.580 | 0.955 | 262 |
| VAR034 | 4.031 | 0.982 | 262 |
| VAR035 | 3.626 | 1.110 | 262 |
| VAR036 | 2.866 | 1.083 | 262 |
| VAR037 | 3.714 | 1.161 | 262 |
| VAR038 | 3.382 | 0.748 | 262 |
| VAR039 | 3.595 | 0.597 | 262 |
| VAR040 | 3.282 | 0.941 | 262 |
| VAR041 | 3.031 | 1.026 | 261 |
| VAR042 | 3.584 | 1.068 | 262 |
| VAR043 | 3.557 | 0.663 | 262 |
| VAR044 | 4.354 | 0.479 | 257 |
| VAR045 | 3.188 | 0.836 | 261 |
| VAR046 | 3.137 | 0.692 | 262 |
| VAR047 | 3.395 | 1.103 | 261 |
| VAR048 | 3.664 | 1.118 | 262 |
| VAR049 | 4.004 | 0.859 | 257 |
| VAR050 | 3.187 | 1.220 | 257 |
| VAR051 | 3.319 | 1.169 | 257 |
| VAR052 | 3.172 | 1.367 | 256 |
| VAR053 | 3.613 | 1.107 | 256 |

APPENDIX C
SPSS PROGRAM

04/14/80 11.82

```
$ IDENT WP1186,AFIT/LS06 LT. BAXLEY, CLASS 80
$ SELECT SPSS/SPSS
$ LIMITS 25,65K,6K,2K
$ FILE FW,F1S,5L
$ FILE 16,F2S,5L
RUN NAME FACTOR ANALYSIS-THESIS
VARIABLE LIST VAR006 TO VAR043,VAR045 TO VAR053
INPUT FORMAT FIXED(5X,38A1,1X,9A1)
N OF CASES 262
INPUT MEDIUM CARD
RAW OUTPUT UNIT16
RECODE VAR006 TO VAR043,VAR045 TO VAR053 ('A'=5) ('B'=4)
('C'=3) ('D'=2) ('E'=1) ('F'=0)
MISSING VALUES VAR006 TO VAR043,VAR045 TO VAR053 (0)
LIST CASES CASES = 5/VARIABLES = VAR006 TO VAR043,VAR045 TO VAR053
FACTOR VARIABLES=VAR011 TO VAR043, VAR045 TO VAR053/
TYPE=PA2/ROTATE=VARIMAX/FACSCORE=.5
ROTATE=VARIMAX/FACSCORE=.5
OPTIONS 2
STATISTICS 1,2,4,5,6,7
READ INPUT DATA
$ SELECTA TDATA
SAVE FILE PLEASE
FINISH
$ SELECT SPSS/SPSS
$ LIMITS 10,50K,6K,1K
$ FILE 08,F2R
$ FILE FR,F1R
RUN NAME CANONICAL ANALYSIS-THESIS
GET FILE PLEASE
ADD VARIABLES FAC01 TO FAC10
INPUT MEDIUM DISK, REWIND
INPUT FORMAT FIXED(8F10.6/2F10.6)
MISSING VALUES VAR006 TO VAR010 (0)/
FAC01 TO FAC10 (999.0)
CANCORR VARIABLES=VAR006 TO VAR010, FAC01 TO FAC10/
RELATE=VAR006 TO VAR010 WITH FAC01 TO FAC10/
OPTIONS 2
STATISTICS 1,2
READ INPUT DATA
FINISH
$ ENDJOB
```

APPENDIX D
VARIMAX ROTATED FACTOR MATRIX

VARIABLE ROTATED FACTOR MATRIX

| | FACTOR 1 | FACTOR 2 | FACTOR 3 | FACTOR 4 | FACTOR 5 | FACTOR 6 | FACTOR 7 | FACTOR 8 | FACTOR 9 | FACTOR 10 |
|--------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| VAR.11 | 0.3128 | 0.9746 | 0.2961 | 0.1901 | 0.0828 | 0.2292 | 0.0157 | 0.2549 | 0.3731 | -0.0455 |
| VAR.12 | 0.3569 | 0.3681 | 0.1203 | 0.1627 | 0.1262 | 0.2891 | 0.2312 | 0.0455 | 0.1418 | 0.0476 |
| VAR.13 | 0.1785 | 0.8930 | 0.2756 | 0.2795 | 0.0815 | 0.1564 | 0.2164 | 0.0875 | 0.1629 | -0.0789 |
| VAR.14 | 0.1346 | 0.0766 | 0.0522 | -0.0920 | -0.6276 | -0.0589 | -0.0187 | -0.2235 | 0.0972 | 0.0136 |
| VAR.15 | 0.2138 | 0.8469 | 0.1253 | 0.1351 | 0.1882 | 0.2759 | 0.2304 | 0.0140 | 0.2849 | -0.0873 |
| VAR.16 | 0.7457 | 0.2652 | 0.0926 | 0.1480 | 0.1040 | 0.1348 | 0.1392 | 0.1174 | 0.2594 | -0.0991 |
| VAR.17 | -0.3152 | -0.0942 | -0.1319 | -0.0315 | 0.0384 | -0.0455 | -0.0833 | -0.0921 | -0.0921 | 0.0131 |
| VAR.18 | 0.6845 | 0.3212 | 0.1234 | 0.1170 | 0.1222 | 0.1562 | 0.1078 | 0.1935 | 0.2251 | -0.1075 |
| VAR.19 | 0.2542 | 0.4827 | 0.0627 | 0.1646 | -0.0795 | 0.1473 | 0.1631 | -0.0178 | -0.0334 | 0.5330 |
| VAR.20 | 0.6362 | 0.1635 | 0.0929 | 0.1373 | -0.0640 | 0.1458 | 0.0698 | 0.0983 | 0.3928 | 0.0473 |
| VAR.21 | 0.6216 | 0.1318 | 0.1612 | 0.1197 | 0.1197 | 0.1183 | 0.1097 | 0.0591 | 0.1304 | 0.3241 |
| VAR.22 | 0.6836 | 0.2188 | 0.2318 | 0.0841 | 0.0555 | 0.3541 | 0.0863 | 0.0325 | 0.0975 | 0.2196 |
| VAR.23 | -0.6383 | -0.3153 | -0.0945 | -0.0935 | -0.1250 | 0.2246 | -0.1260 | -0.1949 | 0.0361 | -0.0457 |
| VAR.24 | 0.8234 | 0.2812 | 0.1362 | 0.1463 | 0.1091 | 0.1582 | 0.1247 | 0.0797 | 0.1632 | 0.0273 |
| VAR.25 | 0.1525 | -0.0272 | 0.0731 | -0.0180 | -0.0706 | 0.0508 | 0.0510 | -0.1929 | 0.5679 | -0.1692 |
| VAR.26 | 0.4757 | 0.1346 | 0.1593 | 0.1229 | -0.0656 | 0.4767 | 0.1314 | 0.1013 | 0.2950 | 0.1387 |
| VAR.27 | 0.1851 | 0.1628 | 0.2563 | 0.1171 | 0.1519 | 0.1705 | 0.1345 | -0.0372 | 0.0821 | 0.1150 |
| VAR.28 | 0.2431 | 0.8139 | 0.2213 | 0.1957 | 0.2213 | 0.4635 | 0.0307 | 0.3742 | -0.0307 | 0.1238 |
| VAR.29 | 0.3438 | 0.2731 | 0.1620 | 0.0929 | 0.1828 | 0.1792 | 0.1156 | 0.5907 | 0.1235 | -0.0767 |
| VAR.30 | 0.6623 | 0.5732 | 0.1256 | 0.0519 | 0.0735 | 0.6824 | 0.0471 | -0.0320 | 0.2194 | 0.0180 |
| VAR.31 | 0.4556 | 0.5268 | 0.1932 | 0.0274 | -0.0272 | 0.3081 | 0.0792 | -0.0240 | 0.4257 | -0.0592 |
| VAR.32 | 0.1379 | 0.1268 | 0.0681 | 0.0495 | 0.0370 | 0.1917 | 0.0139 | 0.0737 | 0.0502 | -0.1430 |
| VAR.33 | 0.2519 | 0.2421 | 0.5332 | 0.1604 | -0.0708 | 0.1267 | -0.0092 | -0.0315 | 0.1895 | 0.0977 |
| VAR.34 | 0.1573 | 0.1491 | 0.7456 | 0.2210 | -0.0050 | 0.1160 | 0.0967 | 0.0583 | 0.0281 | -0.0080 |
| VAR.35 | 0.2665 | 0.4790 | 0.2701 | 0.0923 | 0.2419 | 0.1037 | 0.3213 | 0.1405 | 0.0492 | -0.0481 |
| VAR.36 | 0.2478 | 0.5422 | 0.1281 | 0.2916 | 0.1311 | 0.1752 | 0.2034 | 0.1526 | 0.0319 | 0.0227 |
| VAR.37 | 0.1188 | 0.2748 | 0.2180 | 0.7807 | 0.0184 | 0.7873 | -0.1155 | 0.0712 | -0.0258 | -0.0178 |
| VAR.38 | 0.2589 | 0.7227 | 0.1254 | 0.0682 | 0.0008 | 0.4544 | 0.1063 | 0.0828 | 0.0368 | 0.0867 |
| VAR.39 | 0.2611 | 0.3224 | 0.1319 | 0.2294 | -0.0821 | -0.0379 | 0.0826 | 0.0657 | -0.1339 | -0.0132 |
| VAR.40 | 0.2328 | 0.7673 | 0.1898 | -0.0384 | 0.1701 | 0.4316 | 0.0092 | 0.0172 | 0.1153 | 0.0979 |
| VAR.41 | 0.2124 | 0.4940 | 0.2078 | 0.1207 | 0.2260 | 0.2495 | 0.0639 | 0.0469 | 0.1900 | 0.1440 |
| VAR.42 | 0.1254 | 0.1215 | 0.0318 | -0.0235 | -0.0513 | 0.1483 | 0.0361 | 0.1506 | 0.4262 | -0.0155 |
| VAR.43 | 0.2895 | 0.3772 | -0.1146 | 0.1619 | 0.2367 | 0.3093 | -0.0848 | 0.0638 | -0.0218 | 0.0606 |
| VAR.44 | 0.2502 | 0.2717 | 0.0547 | 0.0510 | 0.0136 | -0.1107 | 0.4410 | 0.2731 | 0.1554 | 0.0620 |
| VAR.45 | -0.2307 | -0.6154 | -0.1146 | -0.1712 | 0.0167 | 0.0422 | -0.1195 | -0.0154 | -0.0977 | 0.2472 |
| VAR.46 | 0.1189 | -0.0836 | 0.0834 | 0.2429 | 0.0710 | -0.0262 | 0.1389 | 0.0329 | 0.1321 | 0.0834 |
| VAR.47 | 0.3469 | 0.6032 | 0.0745 | 0.0764 | -0.0010 | -0.0345 | -0.0436 | 0.1480 | 0.7408 | 0.1712 |
| VAR.48 | 0.0426 | 0.1134 | 0.5963 | 0.0611 | 0.2370 | 0.0289 | 0.0148 | 0.0623 | 0.0843 | 0.0937 |
| VAR.49 | 0.0661 | 0.1246 | 0.3691 | 0.5305 | 0.0294 | 0.0980 | 0.2416 | -0.0157 | -0.0153 | 0.0789 |
| VAR.50 | -0.1876 | -0.2645 | -0.1087 | -0.1459 | -0.1376 | -0.1944 | -0.5737 | 0.0431 | 0.0243 | -0.0874 |
| VAR.51 | -0.0392 | -0.1699 | -0.0310 | 0.0494 | -0.5863 | 0.0048 | -0.0518 | 0.0538 | 0.0441 | 0.0565 |
| VAR.52 | 0.6415 | 0.1737 | 0.0702 | 0.1633 | 0.1189 | 0.0942 | 0.0568 | 0.0912 | 0.1593 | 0.0621 |

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AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL--ETC F/8 5/10
A STUDY OF THE RELATIONSHIP BETWEEN WORKER ATTITUDES AND ORGANI--ETC(U)
JUN 80 C S BAXLEY, R K SALOMON
AFIT-LSSR-27-80

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APPENDIX E
CANONICAL CORRELATION ANALYSIS RESULTS

CANONICAL CORRELATION

SIGNIFICANCE

D.F.

CHI-SQUARE

WILK'S

CANONICAL
CORRELATION

EIGENVALUE

NUMBER

| NUMBER | EIGENVALUE | CANONICAL CORRELATION | WILK'S LAMBDA | CHI-SQUARE | D.F. | SIGNIFICANCE |
|--------|------------|--------------------------|------------------|------------|------|--------------|
| 1 | 0.53769 | 0.73314 | 0.34250 | 271.02391 | 50 | 0.000 |
| 2 | 0.14916 | 0.38621 | 0.74053 | 75.98729 | 36 | 0.000 |
| 3 | 0.08072 | 0.28412 | 0.87035 | 35.18158 | 24 | 0.066 |
| 4 | 0.03851 | 0.19628 | 0.94678 | 13.83781 | 14 | 0.062 |
| 5 | 0.01530 | 0.12374 | 0.98470 | 3.94185 | 6 | 0.690 |

COEFFICIENTS FOR CANONICAL VARIABLES OF THE SECOND SET

CANVAR 1 CANVAR 2

| | | |
|-------|----------|----------|
| FAC01 | 0.29010 | 0.10620 |
| FAC02 | 0.10430 | -0.38900 |
| FAC03 | 0.78716 | -0.01966 |
| FAC04 | 0.02769 | 0.28665 |
| FAC05 | 0.15326 | -0.68063 |
| FAC06 | 0.02926 | -0.10132 |
| FAC07 | 0.19548 | 0.09747 |
| FAC08 | 0.11839 | 0.42051 |
| FAC09 | 0.34262 | 0.26241 |
| FAC10 | -0.11191 | 0.26154 |

COEFFICIENTS FOR CANONICAL VARIABLES OF THE FIRST SET

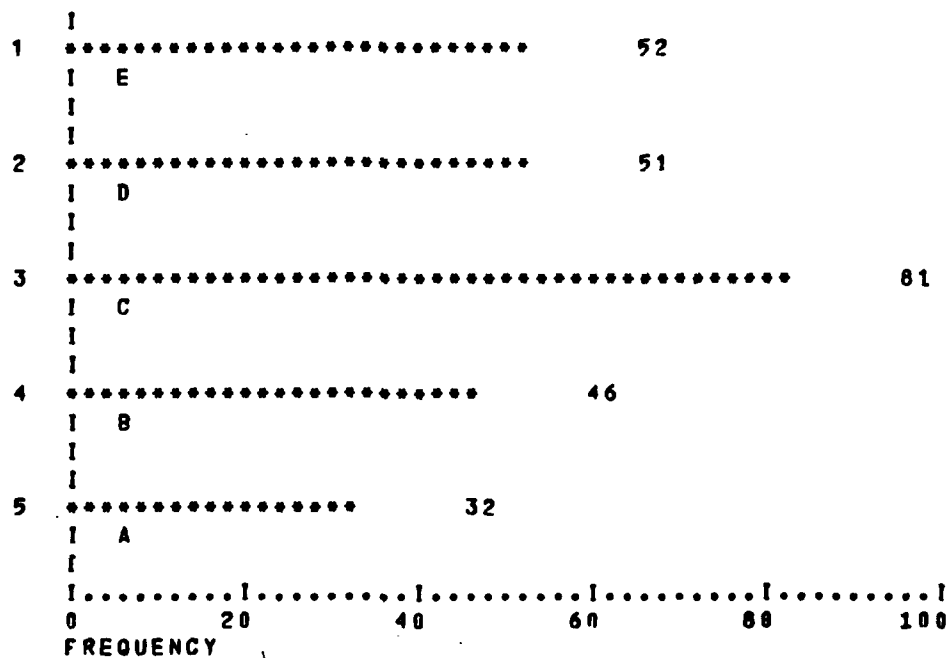
CANVAR 1 CANVAR 2

| | | |
|--------|----------|----------|
| VAR006 | 0.20734 | 1.12075 |
| VAR007 | 0.30280 | -0.24698 |
| VAR008 | -0.23295 | 0.35133 |
| VAR009 | 0.25491 | -0.75819 |
| VAR010 | -0.26279 | -0.61247 |

APPENDIX F
HISTOGRAMS OF QUESTIONS 1-5

VAR001

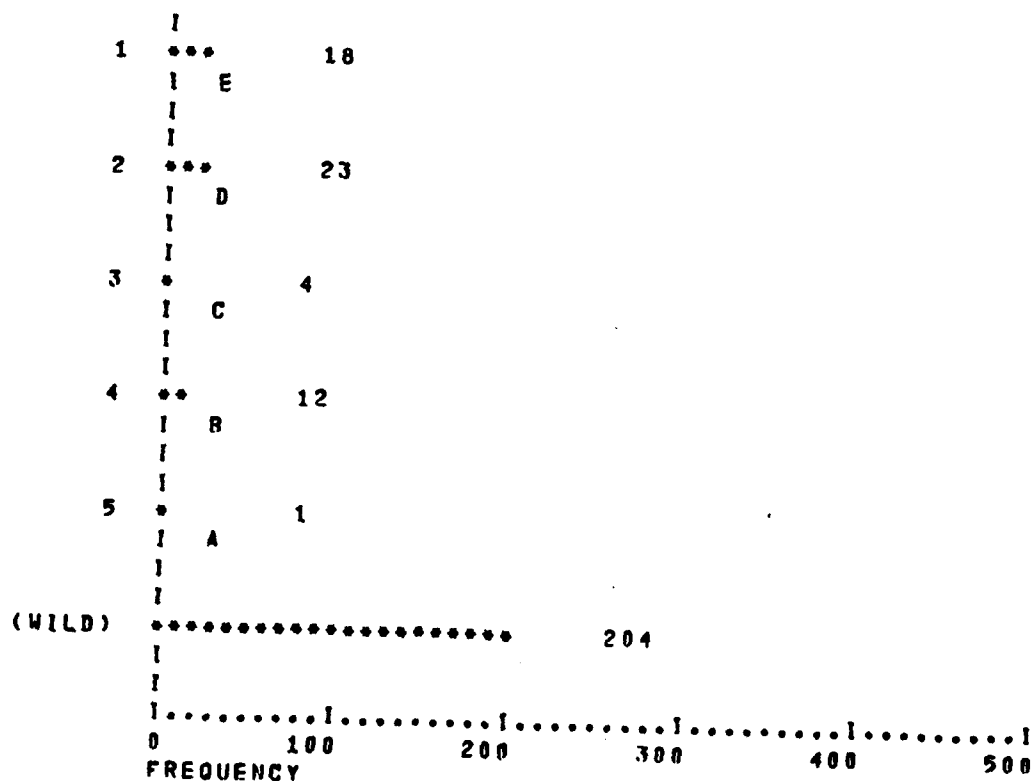
CODE



MEAN 2.828 STD DEV 1.276
VALID CASES 262 MISSING CASES 0

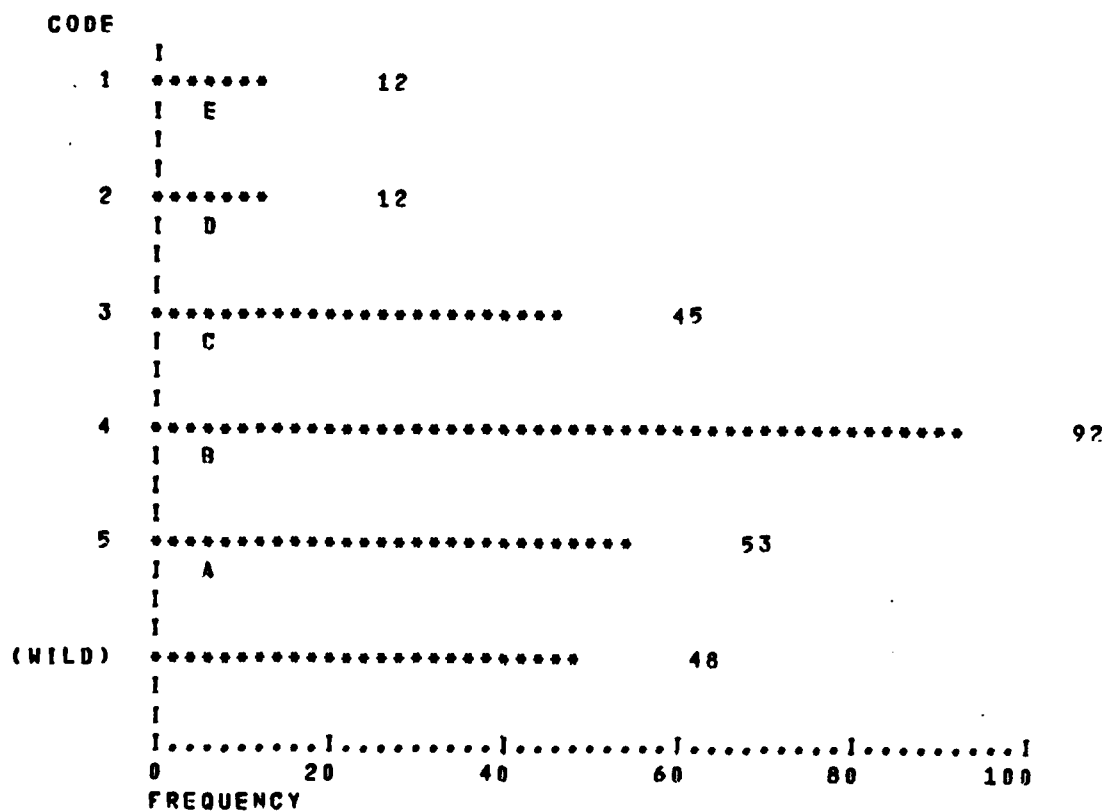
VAR002

CODE



| | | | |
|-------------|-------|---------------|-------|
| MEAN | 2.224 | STD DEV | 1.155 |
| VALID CASES | 58 | MISSING CASES | 204 |

VAR003

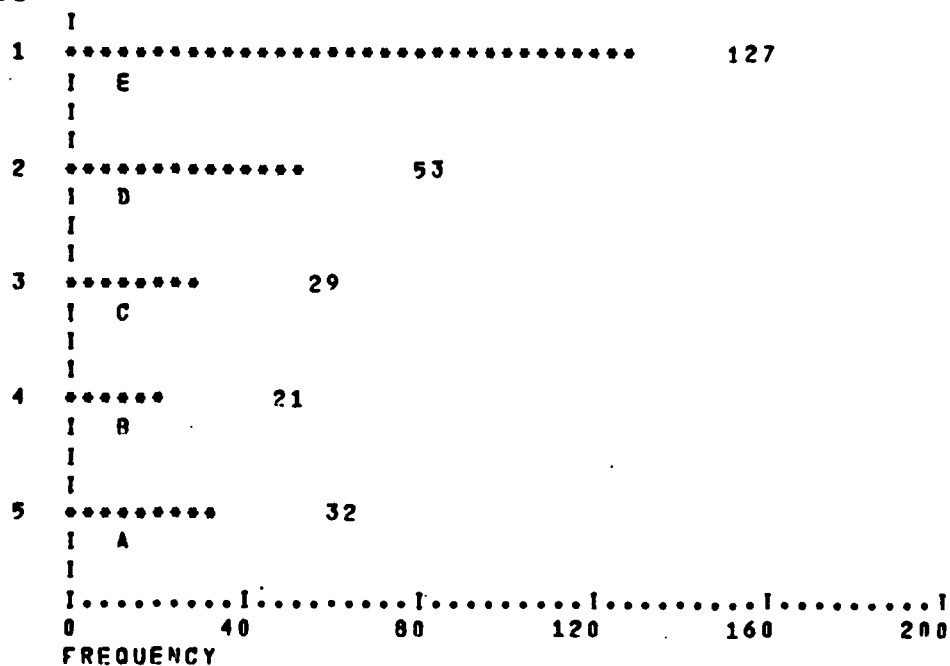


MEAN 3.757 STD DEV 1.065

VALID CASES 214 MISSING CASES 48

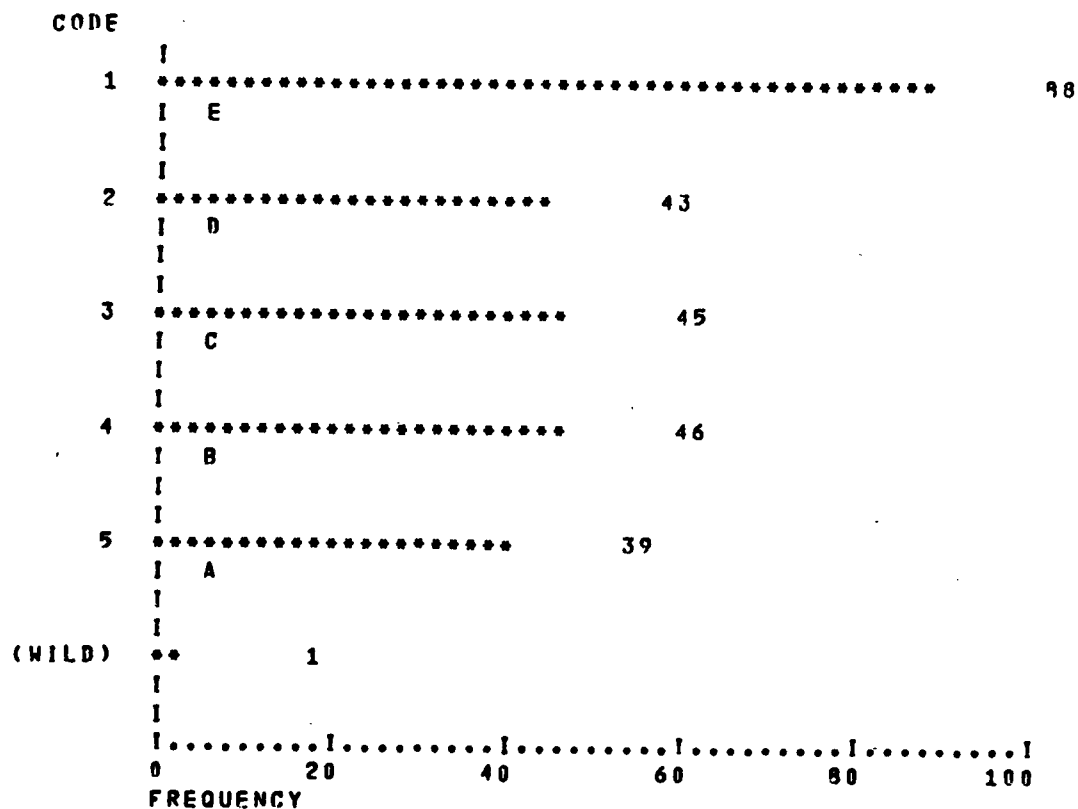
VAR004

CODE



| | | | |
|-------------|-------|---------------|-------|
| MEAN | 2.153 | STD DEV | 1.414 |
| VALID CASES | 262 | MISSING CASES | 0 |

VAR005



| | | | |
|-------------|-------|---------------|-------|
| MEAN | 2.636 | STD DEV | 1.471 |
| VALID CASES | 261 | MISSING CASES | 1 |

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